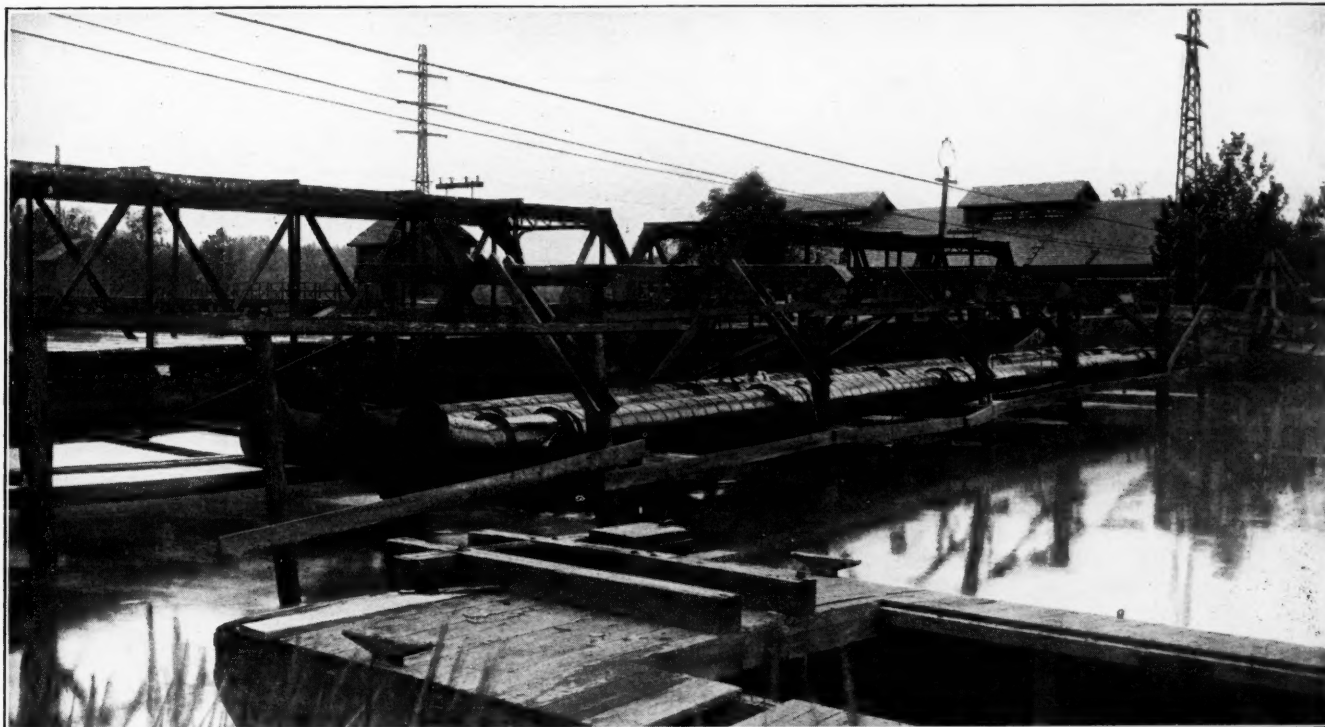


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LAYING SUBMERGED WATER MAINS AT COLUMBIA, S. C.

LAYING SUBMERGED WATER MAIN

Three Mains of Heavy Spiral Riveted Twenty-Four Inch Pipe—Flange Joints Bolted Above Water and Pipe Lowered from Piles—Trench Dug Under Water with Road Scraper.

By JOHN McNEAL, City Engineer.

In the description of the Columbia, S. C., water works published in Municipal Journal for February 8, 1911, it was stated that one source of power used for pumping was obtained from a canal which paralleled the Congaree river, this water-power station being situated on the narrow strip of land between the canal and the river and the force mains from it crossing the canal suspended from a bridge, which bridge furnished access to the hydraulic plant. These mains were three in number, of 24-inch cast-iron pipe. The bottom cords of the bridge supporting the pipes were only a few inches above the level of the water in the canal and thus entirely closed the canal to navigation at this point. This canal was originally constructed as a power canal and is used for power by mills as well as by the municipal pumping plant. A few months ago the Supreme Court of South Carolina declared this canal to be a navigable stream and, through action brought by a citizen of Columbia, ordered the canal bridge to be removed. This, of course, necessitated the provision of some other method of carrying the water mains across the canal. The engineer-superintendent of the water works, F. C. Wyse, prepared

a plan for carrying the three lines submerged across the bottom of the canal, spiral riveted steel pipe to be used, which plan, with some modifications, was approved by the writer and Gadsden E. Shand, engineer for the present owners of the canal, and this plan has now been carried out and the new mains put into service.

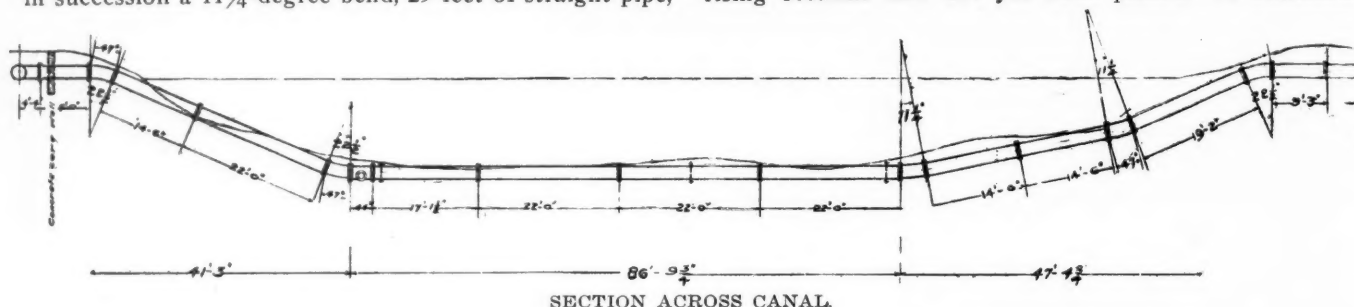
The new pipes are of spiral riveted type, manufactured by the American Spiral Pipe Works, of Chicago. They are 24 inches in diameter; the metal is of No. 3 U. S. standard gauge, $\frac{1}{4}$ inch in thickness, and weighing 78.4 pounds per lineal foot. The bursting strength is approximately 1,250 pounds per square inch. The joints were made with flanges of forged steel, there being thirty-two $\frac{5}{8}$ -inch bolts at each joint. The pipe was heavily coated inside and out with asphalt waterproofing paint. The thickness of the steel was much greater than necessary theoretically, but the possibility of future corrosion decided the selection of the thickest pipe of its type which is manufactured. A chemical examination of the canal water, however, showed that it contained nothing which would cause other than the ordinary corrosive action.

The location of the pipe was designed to follow as

nearly as possible the contour of the bed and sides of the canal, bends being provided for all changes in alignment. The pipe was brought up the banks to an elevation just above the water level of the canal on each side before passing through the banks, so as to prevent any possibility of damage to the banks by water, either during the excavation for pipe laying or afterwards by following the outside surface of the pipe. The approximately horizontal bottom of the canal is about 90 feet wide, the width at water level is about 164 feet, and the depth of water in the middle about 13.5 feet. Each of the three lines of pipe consists of 90 feet $5\frac{3}{4}$ inches of straight pipe, laid horizontally in the bottom of the canal (this including a 12-inch blow-off valve on the raw water line); on that end of this which is toward the river are in succession a $11\frac{1}{4}$ -degree bend, 29 feet of straight pipe,

underside of the pipes, thus supporting the three lines of pipes at five points.

It was planned to do the actual laying of the pipes with the water drawn out of the canal, which was practicable on Sundays, when the power plants using the water were not in operation. It was not possible to draw all the water from the canal, but a depth of 3 feet or more still remained in one part of the channel. The pipes were lifted from the crossbeams by the chain blocks; the crossbeams themselves were removed, and the pipes were lowered uniformly until they reached the water which remained in the canal, the entire time of actual lowering being about thirty minutes. The pipes were not lowered at once to their final bed because of the water remaining in the canal and the fact that the rising sections had not yet been placed. A sufficient



another $11\frac{1}{4}$ -degree bend, 19 feet 2 inches of straight pipe, and finally a $22\frac{1}{2}$ -degree bend connecting with a horizontal line of cast-iron pipe. At the other end of the crossing is a $22\frac{1}{2}$ -degree bend at the bottom, 36 feet 6 inches of straight pipe and another $22\frac{1}{2}$ -degree bend at the top connecting to a line of horizontal cast-iron pipe. At each junction between spiral and cast-iron pipe there is a bell and flange casting at one end and a spigot and flange casting at the other.

The velocity of the current made it impossible to lay the pipe by floating and sinking, and the following method was adopted: Piles were driven along the proposed line in pairs or bents, the two piles in each bent being 12 feet apart and the bents being placed at 19-foot intervals. These piles extended several feet above the surface of the water, were tied together with plank braces longitudinally, sawed off to the same elevation and tied together at the top with longitudinal planks. Following the driving of the piles, a trench about 2 to 4 feet deep and 10 or 12 feet wide was dredged in the bottom and banks of the canal between the two rows of piles, to provide a bed in which to lay the pipes. In digging this trench a dredge was used made from material at hand, the essential part of which was a large size road scraper which was attached to a cable spanning the canal by means of a carrier and properly placed guys. Provision was then made for supporting the pipe temporarily by bolting to each pair of piles an 8x10 yellow pine cross-beam, which thus extended across the proposed location of the pipes and which were all placed at the same elevation a few inches above high water level.

On this simple trestle the three lines of pipes were assembled and bolted together for a length of about 98 feet, which included the horizontal portion of the crossing and the bend at each end. A channel and light T-rail were then attached to the underside of the pipes at each support by means of U-bolts, which bound the three lines together at the desired distance apart. A heavy wooden beam was then placed across the tops of each of five pairs of piles, and the bent stiffened by diagonal braces between this beam and the two piles. Chain blocks of sufficient capacity were then slung from each of these five beams and connected by chains to the channels and T-rails which had been clamped to the

length of these rising sections was then bolted in place at each end and the pipes lowered the remaining distance into the bed prepared for them. Meantime, water jets from hose attached to fire hydrants were used to remove from beneath the pipe the sand which had accumulated after the dredging, and the pipes were settled to a solid, uniform bearing. The piles which had been used in supporting and lowering the pipes were then sawed off level with the tops of the pipes and capped with timbers running across the pipes. Before filling the canal, the pipes were filled with water to prevent their floating.

Several Sundays were consumed in completing the work, the water being drawn from the canal each time. On the last day a test was made by subjecting the pipes to the maximum hydraulic pressure which they will have to sustain in service, and all leaks were closed by tightening the bolts of the joints. This test was made after the laying of the pipes had been entirely completed, but before any connections had been made with the other mains on the canal banks.

The entire work was done by city employees under the supervision of the writer, with the assistance of William A. Moore, the foreman in charge of the work, and F. C. Wyse, engineer-superintendent of the water-works department.

WATER WASTE AND METERS.

The city of Washington, D. C., during the last fiscal year installed 10,150 water meters and discontinued 105; the total number in use at the end of the year being 33,656. As the number of water services was 65,732, 51 per cent of the services were metered. The average cost of installing water meters during the year was \$10.98, which includes the cost of the meter, which was \$5. The average cost of repairing meters during the year was 33 cents each, and of reading meters, 12 cents.

The rate charged for water used through meters is 4 cents per hundred cubic feet for all used in excess of 7,500 cubic feet, for which amount a minimum charge of \$4.50 is made. Where the water services are not metered, water for domestic services is charged for according to the number of stories in the building and its frontage. For premises of two stories with a front width of 16 feet or less, the minimum rate is \$5 per

annum, and for each additional front foot or fraction thereof, 31 cents is added. For each additional story, one-third of the charge as computed above is added. For business premises which are not metered the rates are from \$1 to \$25 per annum. Where the rate is \$25 or more, a meter is required to be installed at the expense of the consumer.

The consumption during the year was at the rate of 162 gallons per capita, a decrease of 17 gallons, or 10½ per cent, from the consumption of the previous year. This decrease is attributed in part to the unusually mild winter of 1912-1913, and in part to the waste prevention service. By means of the pitometer service for the prevention of water waste underground leakage was found and stopped amounting to 4,196,000 gallons daily. This is much less than had been discovered in previous years, a natural result of the practice of the department in stopping all leaks which are discovered and an evidence of the good work which the pitometer service is doing. The total expenses of this service during the year were \$37,688.20. This cost is less than one-half of the value of the water saved at meter rates, but considerably more than the actual cost of pumping the amount of water saved. It should be remembered, however, that the loss would continue from year to year if not discovered and remedied, and would have been enormously greater than this had it not been for the past work of this leak-detecting service.

SYRACUSE WATER WORKS

Meters—Use of Automobiles—Card Indexes—Economy in Pipe Laying—Reduction of Rates— Supervision of Watershed

One of the most interesting water works reports which has reached this office for some time is the report for 1913 of George A. Glynn, superintendent of the bureau of water of Syracuse, N. Y. Not the least interesting feature is that it reached this office about five weeks after the end of the year to which it referred—December 1, 1913. The following is taken, in abstract and by sections, from the report:

Syracuse obtains its supply from Skaneateles Lake, which has an area of 15 square miles and is 466 feet above the Erie Canal at Syracuse. Water is brought from it a distance of 19¼ miles by two cast iron conduits, each 30 inches in diameter, and is distributed by gravity through all parts of the city, a distributing reservoir being located 221 feet above the canal and having a capacity of 121 million gallons. Adjacent to the reservoir is a steel stand-pipe encased in brick which serves a large area of high land in the southeastern section of the city. (See Municipal Journal for October 5, 1910.) There are about 210 miles of distributing mains, varying in size from 36-inch to 4-inch, there being very little of the latter, the greater part being 6-inch and 8-inch.

At the end of the year there were 25,114 meters in operation, or about 97 per cent of all the services. There are still about 600 services with only one faucet connection that are unmetered. The consumer pays for the meter and keeps it in repair, the bureau reserving the right to do the repair work at actual cost. In 1912 meter repair apparatus was installed in the repair shop of the bureau. Formerly meters were sent to the factory for repairs, but it has been found that the cost of labor of repairing does not exceed the former express charges to and from the factory. Only one meter repairer and one meter setter are employed, which is claimed to be a smaller force than is employed by any other city in the country which does all its own work and has over 25,000

meters to care for. The greatest damage to meters is done by exposure to frost, the repairer estimating that fully 90 per cent of the meter repair work is made necessary by this cause.

At the close of construction last year, mains had been laid in every street which had been ordered paved and services installed to the curb for every property, and there was not on file an application for a water main in any graded street containing a dwelling without water. The constructing of mains and services in streets which have been ordered paved is obligatory on the part of the bureau, but it also aims to keep pace with or even anticipate all building development, and it now has mains in the city streets in front of 60 miles of vacant property and connections carried to the curb opposite more than 3,000 vacant lots. On the other hand, it refuses to lay mains in streets which have not been accepted as being of official grade, because of the considerable expense to which it has been put in lowering mains when streets are regraded.

On January 1, 1912, the transportation facilities of the bureau consisted of 13 horses, 1 automobile and 1 runabout. Since then the bureau has changed from horses to motors, with the result that it now does considerable more work than in 1911 at no greater cost and with greater efficiency and promptness and readier response to emergency calls than was possible with horses. The transportation equipment of the bureau now consists of 1 automobile, 2 runabouts, 1 break motor (used only for emergency), 1 truck for general purposes, 1 truck for the hydrant crew and 2 horses. The motor trucks enable the bureau to get full 8 hours work on all its construction, and transfers men from the shop to leaks and breaks with a great saving in time and cost to the city, and obtains more hours of labor from all the men who have to be carried to their work.

A card index has been prepared of all the hydrants in the city, a card for each hydrant. The hydrant foreman reports all work done and this is copied each night upon the backs of the corresponding cards, so that it can be learned at any time when each hydrant was inspected, when repaired and what was done to it. The night watchman also takes care of a valve card index in the same manner, and a similar card index is kept of all services of every kind which are installed.

The force of the bureau consists of 64 men besides the superintendent and consulting engineer. Six of these constitute the "break crew," which work in three 8-hour shifts. These men study the maps and records on which are shown the gates, approximately 3,000 in number, keeping up with the new construction. Mr. Glynn states that during the two years in which he has been in charge these men have never failed to shut off promptly the right gate in case of trouble.

ECONOMY IN OPERATION.

The superintendent states that when he was appointed on January 1, 1912, the only direction given him by the Mayor was "that the bureau be managed economically, efficiently and wholly in the interests of the citizens of Syracuse, its owners." In nothing connected with the department does the superintendent appear to take more pride than in the matter of finances. Figures are given in considerable detail showing comparative incomes and expenditures during several years. One of these statements is that, although the business done in 1913 was \$230,000 greater than in 1901, the cost of operation was approximately \$15,000 less. During the past two years assets of \$100,000 have been added to the plant; \$100,000 worth of original bonds purchased; bond principal and interest amounting to \$406,150 paid; the plant put in the best possible condition, and a balance left in the banks

approximating that at the beginning of this two-year period. It is estimated that the water furnished to the city without charge has a value of \$100,000 a year. In making up the books of the department there are included in the disbursements not only those for labor and materials, but also the bond interest and principal and taxes. Nothing is allowed for depreciation on the total valuation of about \$5,250,000, but on the other hand, extension work is included in the annual maintenance account, and considerable amounts are used each year in redeeming bonds.

An excellent indication of the increased economy with which the plant is being run is the fact that, under the system of bookkeeping just stated, it has been found possible to reduce the rates from a maximum meter rate of 25 cents per thousand gallons with a minimum charge of \$10 a year for a two-story house (the rates charged by the private company from which the city purchased the plant) to 16 cents per thousand gallons with a minimum charge of \$5 a year. The minimum rate to manufacturers also has been reduced from 6 cents for all quantities in excess of 30,000 gallons a month to 4 2-3 cents for quantities in excess of 57,100 gallons.

The reduction which the bureau brought about in excavating for and laying street mains during 1912 was briefly described in our issue of October 2, 1913. In 1913 Foreman Sheehan obtained an average cost of 80 cents per cubic yard for excavation (in which is included the cost of pipe laying, calking and backfilling), although in some sections the material excavated was shale rock and solid rock, the hardest digging in the city. The costs of individual jobs varied in 1913 from 40 cents to \$1.52, only three jobs running over \$1, however. Of 33 jobs only 8 contained more than 1,000 feet, and the majority were less than 500 feet in length.

From time to time the superintendent has caused bulletins to be posted in the various branches telling of economies effected by the men in charge, which has been a stimulus to the men and has promoted commendable rivalry in their efforts to give the city the best possible service at the least necessary cost.

SUPERVISION OF WATERSHED.

In 1906 the Public Health Committee of the Academy of Medicine began making systematic inspections of Skaneateles Lake, and in 1907 the health committee of the Chamber of Commerce joined in the work. Many small sources of farm and domestic drainage were found scattered along the entire lake shore, which might in the aggregate contaminate the city water supply. That they had not done so was due to the length of the lake—18 miles—and its depth of 100 to 250 feet, giving it time for natural purification before the water entered the conduits. In 1908 a summer resort property known as Fair Haven was bought and cleaned up, and a sewage purification plant was built at another resort known as Glen Haven, and the sanitary conditions of several farms were improved. In the same year the water department established a pail system of sewage disposal, collecting the pails from the cottages along the lake shore by a city boat, and by means of wagon from those inaccessible by boat. The contents of these cans were taken to a cultivated field about one mile beyond the head of the lake and plowed underground into a bed of blue clay which offers no chance of seepage into the lake. The cans are cleaned with spring water and chemicals and replaced when making the next collection. The bureau is now maintaining a constant patrol upon the watershed as well as the lake front. The cottagers on the lake have constituted themselves a voluntary sanitary corps, and the farmers on the watershed have, on the whole, co-operated with them. During 1912 and 1913 not one com-

plaint was made by a cottager to the bureau nor of a cottager by the sanitation force.

Up to 1910 the inspections were made by unofficial committees, but in December of that year the Mayor appointed an advisory commission to represent the Academy of Medicine, the Chamber of Commerce and the people of Syracuse, which secured a friendly co-operation between the citizens and the city officials. In 1911 the city purchased the hotel and property, including 150 acres of land, known as Glen Haven, for \$40,000, which was paid from the treasury of the water department. The standing timber on the property was estimated to have a value approximating this, and in 1912 the College of Forestry of Syracuse University was given charge of this land under an arrangement whereby the area will be kept in permanent forest and operated on a business basis.

This work of forestry was assigned to Professor Nelson C. Brown, of the College of Forestry, and his report for the years 1912 and 1913 is given by Superintendent Glynn in his report. An abstract of this report will be given in another issue.

MUNICIPAL LIGHTING PLANTS IN MASSACHUSETTS.

In June, 1913, the town of South Hadley, Mass., appointed a committee to investigate the subject of the municipal ownership of its lighting plant by that town, and this committee has recently reported, favoring such ownership, presumably to be effected by the purchase of the plant of the South Hadley Falls Electric Light Company, which has been furnishing light to the town for about twenty years. As this committee was not composed of experts, it employed William Plattner, a consulting engineer of Boston, to make the investigation and prepare the report. The committee itself, however, visited a number of towns in the state where the conditions were similar to those in South Hadley, but which owned their lighting plants. Eight towns were visited which were purchasing and distributing electric current but not manufacturing it (which plan is proposed for South Hadley), and found these all heartily in favor of municipal ownership for both financial reasons and the better service rendered. The committee notes with interest that "the matter of politics has not interfered in any case with the successful administration of its affairs." The state law provides that towns owning municipal lighting plants shall elect three electric light commissioners, one to be elected each year to serve for three years, and that these in turn shall appoint a manager, thus removing the control as far as possible from political influence.

In his report Mr. Plattner states that there are at present 32 municipal lighting plants in operation in Massachusetts, 16 of which purchase their current from outside sources. Of all the plants that started into municipal ownership in Massachusetts only one—Needham—has discontinued the business, and this plant was operating a street lighting system only, with no commercial lighting. Among the towns purchasing current are Norwood, Wellesley, Belmont, West Boylston, Ashburnham, Templeton, Groveland, Hingham, Rowley, Marblehead, Shrewsbury and Hull. Two of these purchase current from other towns, the others from private companies. Municipal plants are not the only ones which purchase current from outside sources, as there are more than 40 private corporations in the state which do this.

The larger part of the consulting engineer's report dealt with the value of the existing plant, which was ascertained with a view to its purchase. The company

had not declared any dividends, but had created a depreciation reserve of something less than \$20,000. The consulting engineer estimated the physical property as worth \$19,373 (replacement value), and that it would require nearly \$9,000 for improvements to put the plant and distribution system in good and effective condition. The income for the year ending June 30, 1913, was \$16,534, and his estimate of the fixed charges—interest, depreciation, serial bond payment and insurance—the annual expense of operation and the loss in taxes, totaled \$11,710.

HYPOCHLORITE AND TYPHOID IN TRENTON

Typhoid Cases Reduced More Than Seventy Per cent Since Use of Hypochlorite Began—Amounts of Chlorine Used and Apparatus

By LEWIS B. TRAVER, Acting City Chemist.

The weekly reports of typhoid fever for 1913, as shown by the statistics issued by Dr. Alton S. Fell, health officer of the Department of Safety, show a decided decrease from previous years. According to these reports, there have been only 72 cases of typhoid fever during the past year, and on the first of this year, 1914, there was not a single case of typhoid in the city.

For the five years previous to 1912 (the first year during which the present system of sterilization of the drinking water by hypochlorite of lime was used) there was an average of 265 cases of typhoid fever annually. The year 1911 had a total of 302 cases, which is considerably above the average. The highest number of cases in one week in 1911 was 24, while in 1912 and 1913 the highest number of cases was 7.

The accompanying tables show the number of cases reported each month, and also the number of cases reported each week, showing the uniform decided decrease in the years 1912 and 1913 over 1911:

TABLE 1.

No. of cases each week.	1911. Wks.	1912. Wks.	1913. Wks.
0.....	3	12	19
1.....	6	13	17
2.....	7	7	6
3.....	3	11	5
Above 3.....	33	9	5

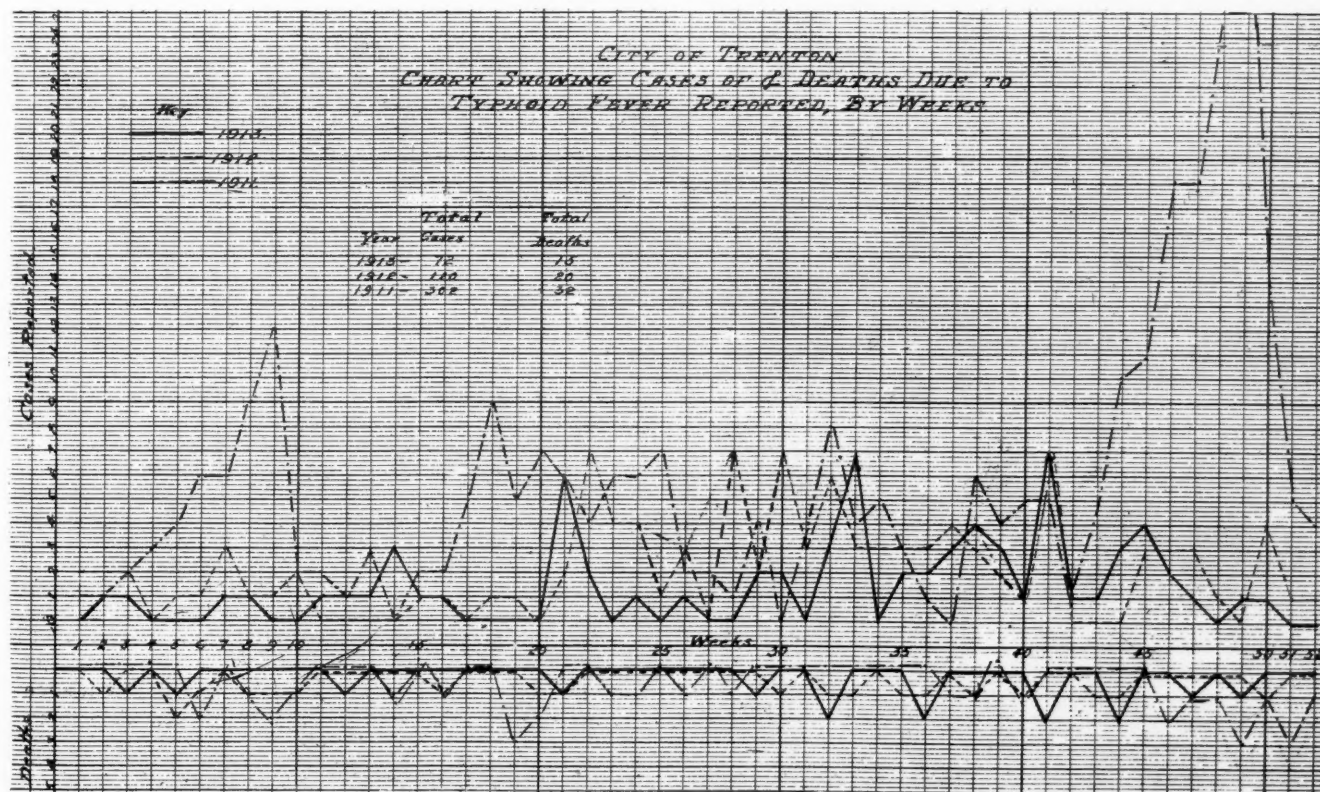
TABLE 2.

Months.	1911.	1912.	1913.
January	11	7	2
February	33	6	2
March	8	2	3
April	9	3	5
May	27	10	8
June	25	12	2
July	7	18	5
August	24	17	12
September	11	11	12
October	16	8	12
November	82	10	7
December	49	6	2

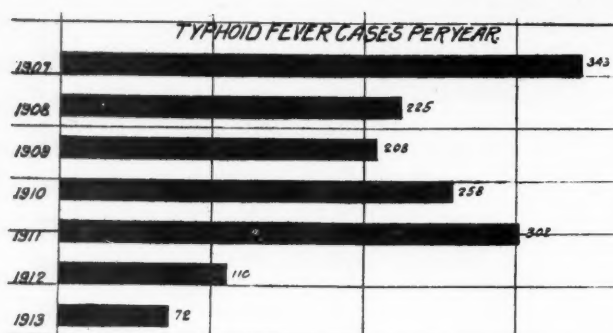
Totals 302 110 72

The system of sterilization with hypochlorite of lime was started on November 9, 1911, under the supervision of the State Board of Health, with 0.4 parts of available chlorine to a million of water. This was found to be insufficient and was raised to 0.8 p. p. m. In February, 1912, the city undertook the supervision by placing the operation of it under the city chemist. During the year 1912 the treatment varied from 0.7 to 1.0 p. p. m., with an average pumpage of 20,000,000 gallons daily. In commercial terms, from 17 to 24 pounds of hypochlorite of lime (35 per cent available chlorine) was added to a million gallons of water. The treatment for the year 1913 varied from 0.3 p. p. m. (7.2 lbs. of hypochlorite of lime) in winter to 1.0 p. p. m. in summer. The amount of chlorine added to the water depended upon a number of conditions—turbidity and temperature of the water, and the B. Coli; the former are of course supplementary to the latter.

Tests of the treated water show a decided decrease in the number of bacteria at 37°. The raw water gave for B. Coli positive results in 1 c. c. in 98 per cent of the



TYPHOID CASES AND DEATHS IN TRENTON, BY WEEKS DURING 1911, 1912 AND 1913.



TYPHOID CASES PER YEAR IN TRENTON.

tests, while in the treated water the tests show about 15 to 20 per cent positive. The average reduction of the bacteria at 20° has been about 94.1 per cent.

The sterilization plant was installed at a cost of \$4,500, and has been in constant operation since 1911. It requires 3 men, working on 8-hour shifts, to look after its operation, mixing solutions and regulating the gallons flow of the hypochlorite solution, etc. (A description of the plant was given in our issue of April 18, 1912.)

The plant is in a two-story frame building, the lower floor of which is divided into two rooms, one for the storage of the chemical, the other for the outlet of the tanks, the orifice, etc. On the second floor are the office and operating rooms, containing two large storage tanks of 1,480 gallons capacity each, and two chemical dissolving tanks which feed into the storage tanks. The chemical is dissolved into a 2 per cent solution and is fed into the well by the orifice according to the rate of pumping, from which well the water is pumped to the reservoir, the water requiring about one hour and a half to pass from one to the other.

This plant is not intended to be permanent, as a filtration plant is now in the course of construction, which will have a capacity of 30,000,000 gallons daily and will cost the city about \$330,000, and is expected to be in operation this summer.

SEWER CONSTRUCTION AT TAMPA.

For the Information of Contractors.

The city of Tampa, Florida, is to build a system of sewers and sewage disposal plants, which is estimated to cost approximately \$500,000. There will be two disposal plants, one of which will contain 12 reinforced concrete tanks 25 feet in diameter, and the other 3 reinforced concrete tanks 25 feet in diameter; these being what is known as Imhoff tanks. There will also be a centrifugal pumping plant of about 3,000,000 gallons capacity, which will be contracted for separately, but the pumping station and equipment and the force main will be included in the main contract. In this contract also will be two ejector pumping plants, each with a capacity of 750 gallons per minute, together with the force mains.

The sewer is to be partly of vitrified clay pipe of sizes from 8 to 36 inches, and partly of cast iron pipe from 8 to 36 inches. The quantities of pipe of the various sizes and depths of trench are estimated as follows:

Vitrified Pipe.—8-inch: 148,668 feet, 8 feet or less in depth, and 26,218 feet, over 8 feet; 10-inch: 1,746 feet over 8 feet deep; 12-inch: 1,110 feet 8 feet or less deep; 18-inch: 1,950 feet 8 feet or less, 300 feet over 8 feet and 570 feet 10 feet or less; 20-inch: 1,890 feet 10 feet or less and 400 feet over 10 feet; 22-inch: 314 feet 10 feet or less and 1,300 feet over 10 feet; 24-inch: 2,100 feet 8 feet or less, 567 feet over 8 feet and 1,711 feet 10

feet or less; 30-inch: 1,195 feet 8 feet or less and 300 feet over 8 feet; 36-inch: 2,092 feet over 8 feet.

Cast Iron Pipe.—8-inch: 1,317 feet 8 feet or less, 3,344 feet over 8 feet, 350 feet 10 feet or less and 845 feet over 10 feet; 10-inch: 2,380 feet over 8 feet and 415 feet over 10 feet; 12-inch: 3,264 feet 8 feet or less, 2,599 feet over 8 feet and 2,380 feet over 10 feet; 16-inch: 4,250 feet 8 feet or less, 4,606 feet over 8 feet and 1,858 feet over 10 feet; 18-inch: 2,375 feet over 8 feet, 475 feet 10 feet or less and 1,580 feet over 10 feet; 24-inch: 3,825 feet 8 feet or less, 4,650 feet over 8 feet and 215 feet 10 feet or less; 36-inch: 440 feet 8 feet or less.

The total lengths are about 36.4 miles of vitrified pipe and 7.8 miles of cast iron.

There will also be 579 manholes in trenches 8 feet or less deep, and 104 in trenches more than 8 feet depth; 87 drop manholes, and 25 flush tanks. The prices for each of these is to cover the entire construction complete. There are also items for cast iron fittings and for lumber used as supports for sewers or for sheeting ordered left in the work.

The engineers for this work are Twombly & Henney of New York City. Plans and specifications can be obtained from Allen Thomas, clerk of the Board of Public Works. Bids will be received until 2 o'clock P. M. February 3.

LOCAL SECTIONS OF AMERICAN WATER WORKS ASSOCIATION.

The new constitution of the American Water Works Association authorizes the formation of local sections, it being believed that this would be advantageous to both the society and the members as individuals. The Executive Committee of the Association has authorized the formation of a New York section, to include all members living in eastern New York and New Jersey, and a preliminary meeting was held in New York on January 20th, the purpose of which was the organization of this section; the business of which was followed by a paper by George W. Fuller, entitled "Croton Water, Its Quality and Improvement."

The meeting adopted a short constitution and elected an executive committee to direct the affairs of the section. This committee consists of five members—Allen Hazen, Morris R. Sherrerd, J. Waldo Smith, Henry De F. Baldwin and Robert E. Milligan—to serve one, two, three, four and five years, one new member to be elected each year in the future.

Mr. Fuller's paper was discussed by D. W. French, who spoke of the work done by the Hackensack Water Company; by Dr. W. P. Mason and Secretary J. M. Diven, who referred to the needs of Troy, N. Y.; by Nicholas Hill, Jr., member of the Filtration Commission of New York City, and by Dr. Frank E. Hale, chemist at the Mount Prospect Laboratory in Brooklyn, N. Y. The meeting promised exceedingly well for the future of the New York section.

This is a move on the part of the American Water Works Association from which many of its members expect very desirable results in an increase in membership and a more active interest in the Association than is to be expected from meetings at twelve months' intervals only. The New England Water Works Association has for years held monthly meetings. Most of its members live in New England, and it thus would occupy much the same position, so far as securing attendance at such meetings, as would a section of the American Water Works Association. This would seem to indicate that it should not be impossible to obtain equal success with monthly meetings of such sections. The advantages of such frequent gatherings is self-evident.

WATER WORKS STATISTICS OF AMERICAN CITIES.
TABLE NO. 1.—WATER CONSUMPTION AND COST—MUNICIPAL PLANTS.

City.	Water Consumption.			Cost of plant per million gals. annually.	Per Day per Capita of			Cost of plant per million gals. annually.
	Total. per day.	Total population supplied.			Maximum daily.			
		Population supplied.	Population supplied.					
Arizona								
Phoenix	2,605,084	144	144	\$466	144	3,500,000	\$24	
Arkansas								
Batesville	134,806	38	54	...	54	200,000	...	
Fort Smith	2,191,780	66	541	...	...	...	...
California								
San Diego	5,739,499	76	76	1,194	184	9,798,909	184	
Colorado								
Alamosa	110,000	26	110	2,500	83	208,000	83	
Colorado Springs	6,436,419	192	195	1,352	13	13,000,000	13	
Connecticut								
Hartford	8,569,700	68	68	1,319	31	10,130,000	31	
Middletown	2,005,479	87	105	854	17	4,000,000	17	
New Britain	3,808,219	76	77	1,870	85	4,000,000	85	
New London	3,032,775	154	159	1,118	68	2,000,000	68	
Norwich	1,772,102	82	88	1,685	29	2,000,000	29	
Putnam	630,126	96	96	1,130	21	700,000	21	
Southington	684,931	98	137	1,046	17	750,000	17	
Williamantic	943,030	84	84	...	...	...	...
Winsted	1,500,000	166	187	...	...	...	...
Delaware								
Dover	161,205	35	53	776	103	180,000	103	
Wilmington	11,264,900	125	125	736	23	12,400,000	23	
Florida								
Jacksonville	5,378,756	67	96	626	55	6,341,100	55	
Pensacola	1,400,000	52	87	500	20	1,500,000	20	
St. Augustine	549,041	91	549	...	...	850,000	...	
Georgia								
Athens	1,035,000	52	...	565	69	1,100,000	69	
Atlanta	15,991,500	91	...	611	44	...	44	
Bainbridge	42,000	93	100	2,667	600	160,000	600	
Cuthbert	82,191	20	41	3,750	...	70,000	...	
Douglas	54,794	23	13	893	45	250,000	45	
Elberton	135,000	23	31	509	24	6,200,000	24	
Macon	4,843,763	107	130	247	101	2,400,000	101	
Rome	2,451,090	153	189	424	...	2,775,000	...	
Thomasville	252,054	36	36	...	...	...	...
Illinois								
Canon	260,697	22	33	765	122	350,000	122	
Centralia	1,676,712	129	524	327	37	4,500,000	37	
Decatur	3,524,988	100	125	778	35	350,000	35	
Kewanee	273,972	17	160	1,600	145	250,000	145	
Macomb	246,575	35	82	889	46	500	235	
Mattoon	712,328	246	246	500	...	1,669,000	...	
Oak Park	615,359	444	667	68	6	4,000,000	6	
Peru	4,000,000	109	137	375	25	565,000	25	
Savanna	410,958	58	91	940	87	460,000	87	
Spring Valley	5,259,241	96	202	520	14	9,000,000	14	
Springfield	205,479	68	821	...	...	...	...
White Hall	...	...	...	...	...	...	...
Indiana								
Bedford	800,000	80	200	...	89	650,000	89	
Brazil	493,150	41	123	690	40	...	40	
Clinton	301,000	30	40	...	...	...	...
Evansville	9,358,672	124	187	658	...	11,162,000	...	
Garrett	312,330	63	104	533	10	1,000,000	10	
Greensport	821,917	164	205	...	...	...	...
Logansport	4,818,648	219	625	...	11	...	11	
New Castle	1,184,109	98	109	...	117	250,000	117	
Tipton	184,328	36	40	2,985	...	...	...
Iowa								
Ames	130,000	30	30	1,502	85	135,000	85	
Cedar Falls	474,329	72	79	1,673	38	604,000	38	
Massachusetts								
Adams	1,380,821	98	...	...	...	582,000	...	
Andover	561,643	76	...	...	...	...	...
Arlington	1,077,150	83	88	...	...	1,930,692	...	
Beverly	1,851,250	92	92	...	...	...	...
Boston	93,023,810	129	129	...	...	5,902,990	...	
Brookline	2,951,138	40	40	...	...	...	...
Cambridge	10,486,380	80	80	...	...	...	...
Chelsea	2,943,495	65	71	...	...	1,934,652	...	
Concord	1,706,291	78	87	...	...	1,300,000	...	
Danvers	1,123,287	112	...	...	...	2,937,739	...	
Gloucester	1,314,900	48	49	...	...	9,457,307	...	
Lowell	9,560,819	89	89	...	...	...	...
Lynn	6,768,868	66	66	...	...	...	...
Maynard	328,386	55	55	...	...	...	...
Natick	542,745	55	...	...	...	...	...
New Bedford	8,325,312	81	86	...	...	13,160,334	...	
North Adams	467,369	28	30	...	...	...	...
North Attleboro	161,785	28	37	...	...	165,375	...	
Orange	3,022,200	93	93	...	...	400,000	...	
Quincy	234,400	39	40	...	...	...	...
Reading	1,495,400	75	75	...	...	...	...
Revere	6,445,109	80	80	...	...	...	...
Somerville	10,661,000	112	114	...	...	4,227,886	...	
Springfield	2,367,746	69	72	...	...	651,000	...	
Taunton	574,200	82	96	...	...	3,761,212	...	
Turners Falls	2,745,063	91	91	...	...	...	...
Waltham	374,000	48	49	...	...	...	...
Wellesley	11,115,953	69	70	...	...	14,331,680	...	
Worcester	...	...	...	...	...	...	...
Michigan								
Alpena	2,243,530	177	180	...	...	4,000,000	...	
Battle Creek	2,054,800	73	98	...	...	...	...
Big Rapids	2,000,000	40	...	...	...	...	...

TABLE NO. 1.—WATER CONSUMPTION AND COST—MUNICIPAL PLANTS. (Continued.)

Water Consumption.		Per Day per Capita of		Cost of		Water Consumption.		Per Day per Capita of		Cost of				
City.	Total. per day.	Maximum daily.	Total popu- lation.	Population supplied.	yearly con- sumption.	gals. per million	City.	Total. per day.	Maximum daily.	Total popu- lation.	Population supplied.	yearly con- sumption.	gals. per million	
Michigan (Continued)														
Coldwater	769,575	118	170	170	482	33	Jamestown	3,166,907	4,500,000	101	102	827	81	
Flint	4,044,590	102	89	89	72	46	Johnstown	2,320,900	2,237,000	213	215	252	17	
Holland	1,906,666	72	89	89	47	27	Kingsford	7,013,982	2,341,341	259	280	341	34	
Ishpeming	1,200,000	86	90	90	46	27	Lapeer	3,424,657	2,341,341	279	285	330	7	
Jackson	2,870,390	82	96	96	66	17	Malone	1,000,000	1,000,000	142	142	131	7	
Kalamazoo	1,951,200	43	56	56	19	12	Newark	335,616	500,000	47	61	764	...	
Marquette	2,309,800	184	184	184	12	19	North Tonawanda	5,339,049	3,200,000	410	154	257	...	
Muskegon	3,504,247	117	146	146	39	23	Ogdensburg	2,465,753	3,500,000	136	144	444	17	
Niles	3,531,300	86	426	426	33	62	Oshkosh	3,089,531	3,500,000	193	237	1,532	75	
Owosso	543,590	54	360	360	38	12	Peshtigo	1,200,000	2,000,000	200	214	251	14	
Saginaw	9,820,300	179	360	360	38	12	Salamance	1,000,000	1,000,000	200	192	479	4	
Ypsilanti	497,030	71	90	90	1,652	64	Schenectady	10,809,400	14,850,000	135	152	500	25	
Minnesota:														
Albert Lea	360,162	45	72	72	61	23	Solvay	16,000,000	600,000	106	118	635	108	
Bemidji	87,671	15	29	29	1,875	119	Syracuse	2,000,000	2,000,000	267	270	1,027	10	
Chisholm	335,890	41	56	56	3,379	131	Watertown	9,061,545	6,000,000	181	202	546	75	
Cloquet	101,500	14	25	25	3,939	389	White Plains	1,366,100	1,600,000	76	68	433	75	
Lake City	191,300	48	81	81	782	40	Yonkers	8,446,228	94	94	99	1,800	94	
Minneapolis	23,375,600	73	81	81	1,117	23	North Carolina:							...
Owatonna	389,114	56	71	71	41	20	Gastonia	219,800	...	22	20	934	90	
St. Paul	13,168,847	59	69	69	1,117	23	Kinston	80,000	...	20	260	223	84	
Mississippi:														
Jackson	3,150,684	126	131	131	390	33	Mooreville	13,700	15,000	4	86	3,100	55	
Meridian	2,510,000	97	119	119	572	...	Wilmington	1,712,300	1,975,500	49	...	620	48	
Yazoo City	655,000	96	107	107	North Dakota:							...
Missouri:														
Brookfield	98,360	13	13	13	1,667	69	Fargo	2,459,000	4,000,000	136	175	239	48	
Fulton	150,000	29	231	231	511	115	Grand Forks	881,974	1,500,000	67	67	1,159	53	
Higginsville	24,657	8	10	10	38,347,356	42	Williston	246,575	50,000	45	...	800	...	
Kansas City	32,724,557	121	126	126	300,000	365	Ohio:							...
Macao	963,013	65	93	93	113,827,810	834	Bellaire	4,000,000	...	309	400	411	12	
St. Louis	81,875,700	109	151	151	311	61	Cincinnati	51,513,607	67,672,649	131	127	131	27	
Trenton	602,739	100	100	100	...	...	Cleveland	73,284,872	90,700,000	111	113	16	16
Montana:														
Helena	3,490,400	279	269	269	344	16	Coshocton	1,400,000	1,600,000	132	140	362	50	
Nebraska:														
Hastings	654,000	65	70	70	814	57	Delphos	450,000	...	75	112	500	55	
Lincoln	3,039,000	58	74	74	...	...	Elyria	1,767,878	2,360,600	112	135	245	75
New Hampshire:														
Concord	3,000,000	139	148	148	939	25	Lancaster	1,000,000	1,996,000	66	95	423	33	
Dover	550,400	42	42	42	238	104	Mansfield	2,021,917	2,500,000	81	101	271	...	
Somersworth	442,600	74	98	98	470,711	...	Middletown	2,506,800	...	157	175	260	24	
New Jersey:														
Bridgeton	1,391,232	92	115	115	685	10	Napoleon	358,200	...	72	119	231	23	
Dover	262,273	29	33	33	2,789	74	Nelsonville	493,150	...	81	88	231	25	
Madison	377,410	75	75	75	680,000	39	New Philadelphia	816,438	...	85	88	451	13	
New Brunswick	3,739,036	40	40	40	3,728,821	15	Springfield	6,397,095	8,000,000	128	159	579	13	
Perth Amboy	6,755,272	153	170	170	2,875,360	31	Wapakoneta	253,700	...	48	112	801	...	
Rahway	2,015,810	201	288	288	455	35	Youngstown	9,776,000	...	98	112	...	...
Salem	603,760	91	134	134	507	31	Urbana	822,000	1,000,000	117	164	433	38	
Trenton	17,910,840	180	155	155	Oklahoma:							...
New York State:														
Albany	24,825,972	244	244	244	303	50	Enid	85,000	97,600	63	95	7,152	887	
Binghamton	7,187,130	144	144	144	381	27	Guhrle	504,800	600,000	42	84	920	...	
Buffalo	139,521,900	310	310	310	286	29	McAlester	685,000	1,000,000	45	45	929	38	
Canandaigua	857,534	114	114	114	509	49	Oklahoma City	3,760,273	2,250,000	104	104	929	38	
Carthage	546,400	154	154	154	1,250	14	Ponca City	273,972	600,000	50	61	1,356	63	
Catskill	798,646	145	159	159	1,639,188	30	Pennsylvania:							...
Corning	1,279,876	85	87	87	814	26	Bradford	2,000,000	...	117	121	778	4	
Cortland	1,163,800	109	101	101	405	19	Homestead	2,049,200	3,000,000	89	89	200	...	
Dansville	600,000	150	174	174	211	11	Lancaster	7,042,437	2,250,000	140	156	584	38	
Dunkirk	4,322,400	254	300	300	582	13	Lebanon	2,000,000	2,250,000	104	104	929	38	
Glens Falls	2,186,000	136	136	136	385	25	McKeesport	3,657,534	500,000	85	86	730	63	
Goshen	546,500	171	190	190	574	38	North East	493,366	500,000	146	156	406	...	
Homer	150,000	157	100	100	377	33	Oil City	249,306	2,500,000	137	137	521	39	
Hudson	2,000,000	160	164	164	...	...	Reading	14,321,084	19,170,050	141	142	784	15
Rhode Island:														
Pawtucket	6,603,600	73	73	73	17,706,145	9	Shenandoah	1,635,884	...	109	102	836	54	
Providence	17,706,145	75	75	75	...	...	Steeltown	1,635,884	...	109	102	836	54
Tennessee:														
Memphis	1,700,000	100	100	100	...	...	Titusville	2,000,000	...	222	222	326	...
Texas:														
Dallas	1,000,000	100	100	100	Virginia:							...
Washington:														
Seattle	1,000,000	100	100	100	West Virginia:							...
Wisconsin:														
Madison	1,000,000	100	100	100	Wyoming:							...

TABLE NO. 1.—WATER CONSUMPTION AND COST—MUNICIPAL PLANTS. (Continued.)

City.	Water Consumption.			Cost of plant per million gals. annually consumed.
	Total per day.	Population supplied.	Maximum daily.	
South Carolina:				
Abbeville	138,000	25	375,000	\$981
Florence	249,300	25	1,065	\$185
Orangeburg	205,479	31	325,000	533
Rock Hill	200,000	27	300,000	83
Union	196,700	35		89
South Dakota:				
Aberdeen	1,000,000	74	350,000	34
Mitchell	252,900	32		702
Sioux Falls	1,038,110	64		1,184
Tennessee:				
Clarksville	792,300	79	1,200,000	552
Dyersburg	493,150	82	500,000	
Texas:				
Austin	3,084,910	88	5,000,000	799
Denton	287,670	39	550,000	56
El Paso	4,000,000	80	936	139
Sherman	800,000	44	900,000	
Waxahachie	250,000	33	600,000	725
Marshall	500,000	42		110
Utah:				
Salt Lake City	21,940,000	233	22,000,000	781
Vermont:				
Barre	1,500,000	125		602
Burlington	1,135,097	53		
Rutland	3,013,698	200		21
Virginia:				
Clifton Forge	1,511,400a	251	345	5
Harrisonburg	821,320	164	900,000	3
Winchester	865,753	123	1,100,000	34
Washington:				
Seattle	27,397,260	97	38,000,000	1,268
Spokane	32,117,000	292	50,937,000	410
West Virginia:				
Parkersburg	3,000,000	150		449
Wisconsin:				
Baraboo	602,739	96	4,500,000	568
Eau Claire	2,000,000	105		449
Grand Rapids	314,721	48	1,267	1,137
La Crosse	2,763,537	91	6,214,000	23
Monroe	47,686,600	119	62,908,770	16
Oconomowoc	230,136	51	357,000	77
Watertown	123,456	36	1,628	35
Waupaca	796,874	79	1,066,090	601
Wausau	301,632	107	681,000	20
West Allis	2,191,780	122	2,500,000	448
Sparta	287,345	35		39
Wyoming:				
Cheyenne	3,649,312	304	1,038,350	636
Canada:				
Brantford, Ont.	3,201,207	121	4,820,000	1,014
Calgary, Alta.	13,000,000	173		10
Kingsston, Ont.	2,491,195	126	3,871,098	469
Lethbridge, Alta.	1,150,824	95		618
London, Ont.	3,950,515	85	2,033,000	350
St. Catharines, Ont.	2,800,000	175	3,250,000	921
Toronto, Ont.	50,996,330	113		788
Winnipeg, Man.	7,830,665	39	9,144,560	602
				1,632

a—Two-thirds Industrial.

TABLE NO. 2.—WATER CONSUMPTION AND COST—PRIVATE PLANTS.

City.	Water Consumption.			Cost of plant per million gals. annually consumed.
	Total per day.	Population supplied.	Maximum daily.	
Alabama:				
Bessemer	1,000,000	67	200	\$822
Arkansas:				
Helena	1,370,000	82	91	
California:				
San Francisco	39,506,140	88	48,000,000	574
Connecticut:				
Bristol	1,013,972	71	1,250,000	137
Torrington	1,780,821	99	3,500,000	608
Illinois:				
Kankakee	2,016,438	112		
Peoria	8,400,000	117	10,664,500	
Quincy	1,990,000	54	1,154	148
Streator	1,876,700	119	2,240,000	23
Mattoon	383,561		1,000,000	64
Indiana:				
Linton	452,055	57	600,000	784
Richmond	2,407,506	96	3,500,000	723
Terre Haute	4,188,183	72	7,500,000	
Valparaiso	871,130	102	1,160,100	503
Iowa:				
Burlington	2,087,252	85	3,984,480	859
Creston	591,017	84	697,000	73
Des Moines	5,402,739	58	7,000,000	
Iowa City	1,779,000	172	2,270,240	42
Kansas:				
Atchison	1,328,770	83	2,050,000	821
Kentucky:				
Frankfort	2,000,000	166		479
Lexington	2,264,775	60	2,750,000	
Maysville	753,424	94		
Paris	219,200	30	900,000	82
Maine:				
Biddeford, Old Orchard & Saco	1,759,838	53		
Maryland:				
Hagerstown	2,465,753	109	3,000,000	925
Michigan:				
Escanaba	1,331,500	146	3,611,500	461
Menominee	986,301	93		
Minnesota:				
Crookston	410,958	51	500,000	
Rochester	547,945	54	750,000	54
Missouri:				
Chillicothe	657,500	82	1,500,000	
Montana:				
Anaconda	2,958,904	295	5,000,000	
New Jersey:				
Montclair	1,534,246	63		1,028
West Orange	680,668	61		230
New York State:				
Elmira	6,096,438	135	8,000,000	
Mt. Vernon	3,004,800	86	3,500,000	
Seneca Falls	742,465	114		

TABLE NO. 2.—WATER CONSUMPTION AND COST—PRIVATE PLANTS. (Continued.)

City.	Water Consumption.			Maximum daily.	Cost of plant per million gals. yearly consumption.	Cost of maintenance per million gals.
	Total. per dav.	Per Day per Capita of				
		Total popu-lation.	Population supplied.			
North Carolina:						
Raleigh	1,418,300	61	95	1,871,000	...	...
Durham	1,117,802	39	...	.....	...	...
Ohio:						
Delaware	912,523	91	102	1,200,000	\$736	\$31
Massillon	930,018	62	63	.....	...	...
Pennsylvania:						
Chester	3,775,300	54	58	5,260,000	2,245	35
Hanover	958,904	79	95	1,250,000	...	...
Indiana	470,811	67	94	475,000	...	45
Pittsburgh & suburbs....	8,409,156	...	98	.....	...	...
Plymouth	3,000,000	176	115	3,200,000	...	...
Shamokin	4,109,863	117	124	5,000,000	800	...
Texas:						
Comanche	204,660	45	102	.....	...	120
Laredo	1,200,000	75	80	1,620,00	532	98
Virginia:						
Newport News, Hampton & Phoebus.....	2,510,147	50	50	3,500,000	2,191	124
Washington:						
Everett	2,760,571	111	110	4,000,000	...	...
Wisconsin:						
Ashland	1,184,694	98	108	1,871,060	1,563	55
Green Bay	1,453,766	54	62	2,194,800	1,544	59
Superior	1,395,530	34	38	2,840,000	3,185	69

COST OF CONSTRUCTING AND OPERATING WATER WORKS PLANTS.

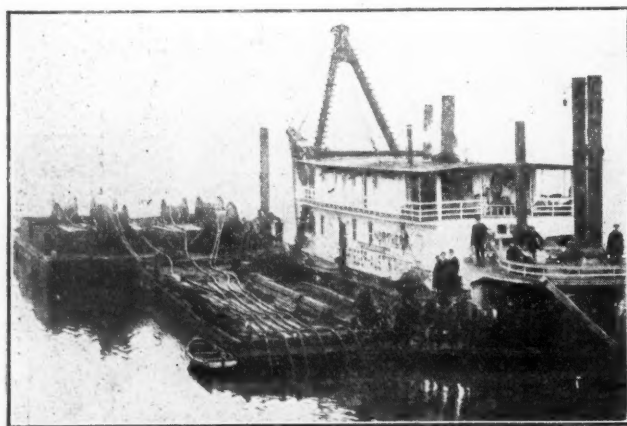
	Municipal Plants.			Private Plants.		
	Number re- port- ing.	Cost of plant per million gals. yearly consumption.	Cost of main- tenance per million gallons.	Number re- port- ing.	Cost of plant per million gals. yearly consumption.	Cost of main- tenance per million gallons.
Average total con- sumption per day.						
Less than 1,000,000....	98	\$1,194	\$93.70	11	\$1,089	\$81.00
1,000,000 to 10,000,000....	118	804	34.25	19	1,107	60.80
More than 10,000,000....	25	744	28.00	1	574	54.00

WATER CONSUMPTION AND COST.

The tables given on the preceding pages are from figures obtained by us direct from water works superintendents, and supplement those published on June 12, July 3 and December 25, 1913. We have calculated the daily averages of consumption from the annual totals given. The construction costs per million gallons of yearly consumption were obtained in an attempt to compare the costs on a uniform basis. There were probably some errors in estimating consumption and some plants are operating at full and others at only half capacity. Which plants pump or purify may be learned from the former tables. The last table averages the figures in the others, the cities being classified by their consumption.

FEAT IN ELECTRIC CABLE LAYING.

What is said to be the second instance on record of laying six strands of electric cable at one time was ac-



Courtesy Pittsburg Dispatch.
LAYING SIX CABLES AT PITTSBURG.

complished last December by the Duquesne Light Company, of Pittsburgh, Pa. These cables are laid across the north channel of the Ohio River in a trench which had previously been dug 4 feet deep in the bed of the river, the cables lying in this trench parallel, with two-foot spacing between centers, so that in case one burns out it will not injure or interfere with the working of any other. Each of the six cables is about 4 inches in diameter and 920 feet long, and is capable of carrying 11,000 volts. The wires are of 3/4-inch copper, and the cables are rubber insulated and steel armored, of the best product of the Standard Underground Cable Company. The cost of the cables alone was about \$12,000, and the cost of dredging the ditch and laying them was about \$8,000 more.

The six reels holding the six cables were placed upon a flat boat, which was carried across the channel by two tugs. The trench was dredged in cementitious gravel, at places 25 feet below the surface of the river. The flat boat was carried directly above the trench, and the cables were paid out all six at once so as to rest in their desired positions in the bottom of the trench. Two weeks was occupied in dredging the trench, but there was apparently no filling of the ditch with sand and gravel of any consequence during that time. It required two days to lay the 920 feet of cables across the river.

POLLUTION OF THE GREAT LAKES.

An International Joint Commission was appointed some time ago by the United States and Canada to study the pollution of the waters of the Great Lakes and rivers which lie on the boundary between the two countries, and to suggest methods for preventing and remedying such conditions as it may find which will be inimical to the health of the citizens of both countries. A report to this commission was made last week by Dr. Allen J. McLaughlin of the Public Health Service, which was the result of six months' investigation from Duluth at the head of Lake Superior to the point where the St. Lawrence river leaves the New York State boundary; also of that portion of the St. John river which forms the boundary between Maine and New Brunswick.

The commission established laboratories for chemical and bacteriological examinations of water samples at fifteen cities and also one on the U. S. revenue cutter Morrill. Over 19,000 samples were taken from 1,400 locations. The report discusses the sources of pollution, classifying them in the order of their importance as sewage from cities, sewage from vessels navigating the waters, and the pollution following rains and thaws. It was found that at the mouth of the Detroit river and of the Niagara river serious pollution extends normally more than ten miles into the lake, and on one occasion was found sixteen to eighteen miles from shore. In all the cities pollution extends to such a distance that it is impracticable to carry the water works intakes out to pure water on account of the enormous cost and diffi-

culty of laying the long pipe lines and of placing the intakes in depths greater than 70 feet. The bulk of the water in the Great Lakes was found to retain practically its original purity, but owing to the difficulties mentioned there is not a single municipality using water from the Great Lakes or their connecting rivers which can be said to possess a water supply which is safe without treatment.

The waters found to be most grossly polluted are the rivers connecting the lakes, upon which large cities are situated. There is no point of either the St. Clair river or the Detroit river from which a safe water supply could be secured, the lower end of the Detroit river being especially polluted. Gross pollution of the Niagara river extends along the American shore from Buffalo to Strawberry Island, throughout the entire Tonawanda channel, and below the Falls extends from shore to shore to and for several miles into Lake Ontario. In April the St. Lawrence along the Thousand Islands showed only a slight pollution, but in August this was greatly increased, undoubtedly because of the summer resort population.

OPERATING WATER PURIFICATION PLANTS*

A Plea for Their More Efficient Operation—Unsuitable Plants Due to Lack of Engineering Advice—

Expert Supervision

By H. P. LETTON.†

Several interesting papers have recently appeared dealing with the operation of sewage disposal plants and emphasizing the necessity for more careful supervision of this kind of municipal work. It is well known to all who have investigated the matter that small sewage disposal plants receive as a rule little or no attention, and that their effluents could be greatly improved under proper operation. Discussion of these matters is therefore advantageous and desirable.

The writer was for some time previous to last July in the employ of the New Jersey State Board of Health, engaged mainly in the supervision of the public water supplies of the state. In connection with this work about thirty water purification plants have been visited upon numerous occasions. As a result of these visits, it became evident that the opinions that had been expressed in regard to the operation of sewage disposal plants were largely applicable to small water purification plants.

The main difference in the two cases is this: Sewage disposal plants are usually built, not because there is a concerted public demand for them, but for the eradication of a local nuisance, or by order of some higher authority. Because of this fact, and because the terms "sewage" and "sewage disposal" are distasteful to the average layman, the plant is generally put in an out-of-the-way place, and either forgotten entirely or placed in the charge of an underpaid, superannuated caretaker who knows nothing of the principles upon which the design of the plant is based; while a water purification plant is generally installed as a result of a popular demand and the consumer is directly interested in its operation in so far as furnishing a clear, colorless and palatable water is concerned. These are the qualities that to the majority of people determine the purity of the water, and as long as they are maintained there is little or no question as to the efficiency of the plant in other ways. As a matter of fact, however, there are many plants which will usually meet the above condi-

tions but which are inefficient both from an economic and a sanitary standpoint.

It is only on rare occasions that a filtration plant has been constructed at the time of the installation of the water works system. In most cases, when the purification plant is added to an existing system, the operation of it is entrusted to the engineer of the old plant. This man may be, and in many cases is, a stationary engineer who thoroughly understands the operation of boilers, engines and pumps but who has absolutely no idea of the principles which underlie the process of water purification.

There is also another point which in many cases affects the results obtained. When it is decided that some form of purification is advisable in connection with a small water plant, it is very rare indeed that a consulting engineer is called in for advice. Instead, the matter is taken up with one or more companies engaged in the business of installing purification apparatus. While these companies are usually competent to give reliable advice, their main business is the selling of equipment. Because of this fact, and because the usual small water company or municipality is weak financially, the filter plant is designed to fit the available money, and the company offering the equipment for the least sum is generally given the contract, regardless of the quality of the material to be furnished. As a result of this practice, plants that are poorly designed, lacking in the necessary equipment for efficiency, or even wholly ill-adapted to the situation are commonly met with. A few cases of this kind which have come under the observation of the writer will be noted.

Probably the worst example was at a plant supplying about a million gallons per day. The supply was originally obtained from artesian wells, but on account of the high iron content of the water a new supply was obtained from an artificial lake. This water was highly colored by its passage through cedar swamps. From the lake the water flowed by gravity to the coagulation basin. This was a rectangular wooden tank of such size that normally less than twenty minutes were allowed for coagulation and sedimentation. During periods of high consumption the time was considerably decreased. The basin was set at such an elevation that at times of low water in the lake it was impossible to obtain the normal supply except by by-passing some raw water. From the coagulation basin the water flowed by gravity to four rapid sand filters of the gravity, circular wooden tank type, without loss-of-head gauges or rate controllers. The agitating rakes were intended to be driven by a water motor, but the necessary power was lacking. The beds were therefore not agitated during washing. From the filters the water passed to a suction well which had been used in connection with the former well supply and which provided less than thirty minutes' storage. Two solution tanks had been provided and connected with a small displacement pump driven from the line shaft to which the main water pumps were attached. The small solution pump was intended to force a solution of sulphate of alumina into the raw water just before it entered the coagulation basin. At the time of the writer's first visit to this plant the chemical pump was out of order and no chemical was being added. It was afterward learned that this was its chronic condition. Tests of the raw water showed it to be slightly acid, owing probably to humic acid from the cedar swamps; consequently the addition of sulphate of alumina would be an absolute loss as far as results are concerned. Analyses of the raw and filtered water showed no material difference, and the filtered water had at times a color as high as two hundred.

*Paper before the New England Water Works Association.

†Sanitary engineer, U. S. Public Health Service.

While the foregoing may seem to be an extreme case, conditions almost as bad were found in several instances. Two other plants were discovered treating acid water with sulphate of alumina only; rate controllers and loss-of-head gauges were almost unknown; and the methods of regulating the amount of chemical applied were very crude. Few calibrated orifice boxes were found in use. Two gravity, rapid sand plants treating waters high in organic matter and often turbid had no coagulation basins; so that they required too frequent washing with corresponding reductions in bacterial efficiency as well as increased costs of operation. Another large plant, using the pressure type of filter, was treating a turbid water with very little time for coagulation. The effluent was frequently turbid, and at times contained aluminum hydrate. One plant of the slow sand type had less than a foot of filtering sand, and had a clear water well holding about a half hour's supply. As a result of this combination, the rate of filtration fluctuated exactly as the demand, and purification was practically nil.

At one rapid sand plant the clear water basin was so small that it was necessary to wash with raw water. Another plant had no arrangement for filtering to waste, so that whenever it was necessary to get at the strainer system the dirty water in the bed was drained into the clear water well.

In the matter of operation conditions were found to be as bad, if not worse. As has been said, the man in charge of a small water purification plant has usually little or no idea of the nature of the process. He operates the plant by "rule of thumb" methods in an endeavor to produce a good-looking water. Although efficient results depend so largely upon the use of the correct quantity of coagulant, the greatest ignorance of this matter was shown. At several plants the engineer stated that he put in a certain number of buckets of alum per day. He did not know how many pounds were used and made no attempt to add it in the same proportion at all times. A few engineers said that they increased the dose "some" when the water was turbid, but did not know how much. In only a few plants was any attempt made to regulate the dosage by the aid of alkalinity and turbidity tests. As a matter of fact, few of the men in charge could be depended upon to make the necessary alkalinity tests. At only two plants treating less than twenty million gallons per day were laboratories maintained, and at these plants the tests, both chemical and bacteriological, were made under the direction of non-resident chemists. The engineers who made the tests were unable to interpret them or apply them in the operation of the plants. At one modern municipal plant absolutely no records were kept. The chief engineer could neither read nor write and could see no use in records of any kind, not excepting pump-age records. The president of the board of water commissioners in charge of the plant stated that the only reason he could see for filtering water was to remove turbidity, notwithstanding the fact that the sewage of over a hundred thousand people was discharged into the river from which the supply was taken, about seventeen miles above the intake.

At one plant visited it was found that, through the laziness of the engineer, the filters were not being washed enough, the deficiency of water due to clogging being made up by by-passing raw water. At another plant the beds were washed too often, resulting in a low bacterial efficiency and a high cost of operation. Over ten per cent of all water filtered was being used for wash water.

It is not believed that such cases are confined to New Jersey. Reports of investigations in Ohio, Pennsylvania,

New York and Illinois show very similar conditions. Much as they are to be deplored, the fact remains that they do exist, and that a discussion of possible remedies is in order.

The most feasible remedy for poor design is a statute requiring the submission of plans for proposed plants or changes in existing plants to the state board of health or some other state authority for approval before construction can legally be carried out. Such a regulation is in effect in a number of states at the present time. Coupled with the appointment of a properly qualified engineer to pass upon all plans, it will satisfactorily care for new works. State supervision of existing plants will, if carried out, do much to remedy the more serious imperfections of construction and operation. This supervision cannot, however, be thorough enough to furnish definite information for the efficient operation of the plant both from an economic and a sanitary standpoint. At best the plant can be visited only about once a month, and this visit is merely to see that a safe and potable water is being produced. From the viewpoint of the state this result is sufficient, but from that of the consumer and taxpayer there are other matters of great importance. He wishes to know, first, that the water is healthful, and then that it is not possible to obtain the same or better results at a less cost by some change in the method of construction or operation of the plant. This latter is out of the field of the state inspector, for it generally requires much experimenting and testing to obtain the point of maximum efficiency.

The plan of having the engineer at the plant make daily tests under the general direction of a consultant at a distance is a step in advance, but it is far from perfect. The engineer's results are open to question; since he is often hurried and makes the tests without knowing the reason for the various steps. Also, since he has but infrequent consultations with the consulting engineer or chemist and is unable in most cases to explain any seeming discrepancy in his results they do not prove to be of as much value as might be expected.

The writer has had in mind for some time a plan for remedying this situation, and it has recently again been brought to his attention by a similar plan which Prof. Earle B. Phelps has put into operation in connection with local health administration in several small Massachusetts towns. The plan is simply this: Let several water companies or municipalities, located not too far apart to combine forces, fit up a laboratory at some central point and employ a competent bacteriologist and chemist to give his entire time to the scientific supervision of their water plants. By so doing each plant would have the benefit of expert advice at a small cost. It would be possible for the chemist to visit each plant one or more days each week, and by so doing to become familiar with its operation. He could instruct the engineer in charge of the plant how to make the necessary daily chemical tests, such as alkalinity, turbidity, etc., and since he visited the plant so often these results could be checked up and would be reliable. In case of emergency he would be able to look after the sanitary quality of the water and thus protect the consumer. He would be able to carry on experiments upon the proper amount of coagulants to be used and time of coagulation. There is a chance for much study in the manner of washing the filters to bring about efficiency and economy. This is a point not considered much in small plants, but which has a considerable bearing on the cost of operation. It requires many visits to a plant to become familiar with its operation and to suggest changes which will increase its bacterial efficiency without increasing the cost.

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JANUARY 22, 1914.

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Duplicate Water Mains.

The water works engineer of a city of considerable size in New Jersey, in one of his annual reports, has called attention to the fact that the city is dependent on a single supply line laid from the reservoir. "Not since 1905 have we had any trouble with this main," said he, "but that fact gives no assurance that trouble might not occur at any time. The importance of such a connection is easily seen when we recall that we have in this city about \$35,000,000 value in buildings and personal belongings. A rupture in the single line supplying this city from the reservoir would lead to at least several hours' work and possibly more than a day's work, and if a fire should break out during the period of repair there would be absolutely no means of preventing an almost indefinite spread of such a fire, resulting in a conflagration the effects of which it is hard to imagine."

As stated in our news columns several weeks ago, on December 25 a reinforced concrete conduit, which is the only line bringing to Montreal water from the St. Lawrence River, failed by the bursting of a section about sixty feet in length. This break deprived the city, with its population of nearly 600,000, of its entire water sup-

ply, except for a small domestic supply which was obtained from the Montreal Water and Power Company, which was able to furnish 15,000,000 gallons a day, the normal consumption being 50,000,000 gallons. The city was without fire protection for eight days while the conduit was being repaired. Sanitary conditions were becoming alarming, residence heating was severely crippled, and a few small fires, although they were finally extinguished, only served to accentuate the helplessness of the city should a large fire break out. To prevent this culminating calamity, special watch was kept night and day through all sections of the city, and the citizens were warned to take unusual precautions against fire. Practically all of the large industries closed down, throwing thousands out of employment, and the loss to the city from this cause alone probably ran into the millions.

Within the last month or six weeks two of the largest cities in the United States have found themselves almost entirely deprived of water supply for fire protection, the cause in each instance being the breaking of an important main, generally that leading from a pumping station or reservoir to the city. This calls attention to the importance of supplying duplicate mains in all parts of a water system wherever this is practicable; and, where it is not, the importance of taking every precaution against any disabling of the single main provided.

There are numerous instances of cities divided by streams, where the pumping station and reservoir are located on the same side of the stream and where but one main connects this with the other section of the city. Under these conditions, any accident to the main, such as a washout or break under the river, would entirely cut off part of the city from its supply, and this by a break which would be difficult of repair. In most of these instances the expense of providing another stream crossing at least one or two blocks away from the existing one would be very small relative to the advantage secured thereby, and it is almost criminal negligence to omit this double protection to the city. So far as possible, in providing the second main this should be placed in such a different location and of such a different character that any accident which might put out of commission one of them would have no effect on the other, and they should be so far separated that a break in one would not endanger the other by a resulting washout.

When the danger which results from the entire interruption of the water supply to any considerable section of a city is considered, it seems almost self-evident that duplicate mains should be provided from the very gate-house of the reservoir or walls of the pumping station to the heart of the city.

Of course, there are instances where the distance from a distributing reservoir to the city is so great that the expense of duplicate mains would be considered prohibitive. In such cases the most nearly absolute security of the one main should be obtained. The conduit should be designed with a large factor of safety against rusting, crushing or other agents of destruction, and should be located at such depth that it is not liable to be undermined by any other constructions. In crossing streams no chances should be taken with the strength of bridges (in general it is better to avoid the suspension of such mains under bridges altogether) and the possibility of washouts by floods should be eliminated.

All this, of course, means additional expense; but every city nowadays relies upon the water supply for fighting fires, and one fire at which water was not available might very readily cause a loss many times that of the cost of the duplicate main or the additional precautions advocated for a single one.

The WEEK'S NEWS

Highway from Quebec to Maine—Progress in Eliminating Grade Crossings—Health Board Asks for Broader Powers—Profitable Municipal Water Plants—Kansas City's (Mo.) Franchises Not Binding—Motor Trucks in Cleveland Blizzard—San Francisco's Municipally-Operated Railway Successful.

ROADS AND PAVEMENTS

Grading Street with Steam Shovel.

Brooklyn, N. Y.—Construction is well under way on the new thoroughfare to be known as Crown street. To meet



Courtesy Brooklyn Daily Eagle.
THEW STEAM SHOVEL AT WORK.

the level of an intersecting avenue a large hill of dirt had to be removed. The accompanying illustrations show the Thew steam shovel in operation and the work that has been accomplished with it.



Courtesy Brooklyn Daily Eagle.
CROWN STREET DUG THROUGH.

Will Build Highway From Quebec to Maine.

Portland, Me.—A new highway is to be built between Maine and the city of Quebec, according to information received by the Maine State Highway Commission from the Quebec officials. In the statement to the Maine Commission the Quebec government asserts that \$300,000 have been appropriated to construct the road from the city of Quebec to the Maine line via Beauceville and St. George, the regular route now used by all Quebec tourists from Maine. The distance from the Quebec capital to the international boundary is about 93 miles and arrangements have been made whereby \$75,000 of the total appropriation will be spent each year. It is believed that this is all that can be expended to an advantage on this important highway during each summer season, and therefore it will take four years

in which to complete the road. The distance between Augusta, Me., and the city of Quebec is about 224 miles. From Augusta the boundary line is about 131 miles, but it will be necessary to build only about 67 miles of road to tap the Maine highway system at Bingham, the principal town in that section of northern Maine.

Plan Brick Road of 125 Miles.

Columbus, Ohio.—One of the best-constructed highways in the country is what State Highway Commissioner James R. Marker of Ohio plans to make of the old National pike from Bridgeport, just across the Ohio river from Wheeling, W. Va., to Columbus, a distance of about 125 miles. The completion of the project will mean an expenditure of more than \$2,000,000, but Commissioner Marker hopes to see the road in use before the end of this year. If present plans are carried out, the road will be the longest brick pavement in the world. It will be sixteen feet wide and will not have a grade heavier than 7 per cent. throughout its entire length. On each side of the paving will be a road nine feet wide of earth macadamized to take care of all travel the street of brick cannot care for. The paving will extend half across the State, passing through the counties of Belmont, Guernsey, Muskingum, Licking and Franklin. From Zanesville to Columbus the Federal Government will furnish part of the funds as an experiment, but in the other counties the State, county, township and abutting property owner will pay the cost of the improvement. Once completed, the road will prove to be the most traveled of any for tourists crossing the State, as it will furnish an excellent connection to the paved roads of Northern West Virginia, along which connection can readily be made to the newly improved roads of Western Pennsylvania leading to Pittsburgh and Cumberland.

To Construct Road Across Mountain.

Newburgh, N. Y.—For the past two months a survey has been made by the State Highway Department for a highway on a ledge of Storm King Mountain which will be known as a part of State Route 3. As a result of the survey it is estimated that the construction will cost \$400,000 for a distance of about four miles. Difficult engineering work in the construction of this road is anticipated, for at the foot of the mountain run railroad tracks upon which the rock, broken from blasting, may fall. Practically inaccessible portions of the country bordering on Storm King will as soon as this highway is completed be thrown open to residents of neighboring towns and greater development of the Storm King region is expected.

Road to Connect 3 Places.

Yonkers, N. Y.—The application made jointly by Yonkers, Mount Vernon and the town of Eastchester for the construction of a state highway to connect the three places will be approved shortly by John N. Carlisle, state superintendent of highways. Information to this effect was brought from Albany by Mayor E. Fiske, of Mount Vernon. Work will be started in the spring. The proposed connecting roadway between the three places begins at Jerome avenue in Yonkers. It runs from there to the state road in Eastchester to the Harlem road in Mount Vernon.

Abolish Community Road Building.

Niagara Falls, Ont.—The Township Council at its regular meeting has abolished the old system of keeping up the township roads. Instead of calling upon each ratepayer to put in a certain number of hours work on the roads each year a special tax is to be levied. This arrangement, it is believed, will be more satisfactory than the old method of

keeping the roads in repair, and will probably be more economical. The old method proved unsuccessful because some of the ratepayers failed to do their share of the work properly, which caused a general feeling of dissatisfaction. Under the new arrangement the ratepayers will be assessed for road repair work, and the work will be done by the township engineer under supervision of the Council.

To Eliminate Grade Crossing Peril.

Sterling, Ill.—For the purpose of eliminating grade crossing accidents throughout Illinois every steam and inter-urban electric road operating in the State has been notified to file with the Public Utilities Commission a detailed statement of conditions and surroundings at grade crossings in its line. Several of the smaller roads have complied with the request and the larger lines are compiling the data as rapidly as possible. Several of the companies have employed special men to gather the information. The plan is the outcome of a conference held in Springfield some time ago between officials of various railroads and Governor Dunne, during which the latter urged that special care be taken to provide suitable safeguards at grade crossings. As soon as all of the reports have been received they will be compiled by engineers in the employ of the commission and steps taken to compel the rail lines to remedy unsatisfactory conditions.

Many Accidents from Unprotected Grade Crossings.

Harrisburg, Pa.—John P. Dohoney, investigator of accidents for the Public Service Commission, laid before that board a report which shows that Pennsylvania has 11,763 grade crossings of steam railroads over public roads; 574 grade crossings of steam and electric roads; approximately 10,000, not accurately counted, crossings of private roads by steam roads, and only 1,619 grade crossings with any sort of protection. To show the need for supervision of grade crossings the report quotes the fatal and non-fatal accidents at grade crossings during the past six years, ever since the old Railroad Commission began to collect data on the subject. In 1908 there were 72 killed and 229 injured, and in 1913 there were 111 killed and 283 injured.

To Organize Highway Superintendents.

Lafayette, Ind.—Steps were taken to organize the recently appointed highway superintendents of the various counties of Indiana into a State association at the second day's meeting of the first annual good roads school, which was held at Purdue university. The university will ask the next State Legislature to pass a law requiring the highway superintendents to meet once a year at Purdue for the purpose of receiving ideas for the building of roads and bridges. It is also proposed to have the State pay the expenses of the superintendents when they are attending the annual conference.

To Apportion Overlapped Appropriations.

Montgomery, Ala.—As a result of the failure of a large number of counties in the state to use the state appropriations for the construction of good roads during the years 1911 and 1912, the overlapping appropriations for these two years amounted to \$92,471.66.

The state highway commission has authorized that this money be apportioned among the 67 counties of the state. This will make available for the various counties of the state in 1914, \$1,380.17, in addition to the regular appropriation of \$2,000.

SEWERAGE AND SANITATION

To Mark Sewer Terminals.

Binghamton, N. Y.—A plan long under consideration for the establishment of sewer connection markers to the curb, will, it is expected, be put in force some time this year. When a sewer is constructed on a street the lot connections are carried to the curb line but in cases of vacant lots they halt there and when a residence is erected much trouble is experienced in locating the terminal of the sewer connection. Often it occurs that a large lot is divided and one of the premises left without sewer connections and occasionally a city has to pay the cost of carrying the lot con-

nection from the sewer to the curb. Sanitary Inspector Hanley and City Engineer J. A. Giles devised a plan some time ago to eliminate this difficulty. It is proposed to place an iron marker at the terminal of each sewer connection running to a vacant lot. The expense of these markers will be one dollar each and they will be charged against the vacant property in making up the sewer rolls, the dollar being refunded when the marker is returned to the department.

Sewer Gas Explosion Damages Building.

Cleveland, Ohio.—An explosion of sewer gas in a conduit belonging to the Cleveland Telephone company at Ontario street and Central avenue has caused considerable damage to adjoining buildings and slight injuries to a score of persons, who were bruised and cut by being thrown to the ground. There were no fatalities.

Urge Broader Powers for Board of Health.

Baltimore, Md.—One of the measures the State Board of Health has prepared for submission to the Legislature gives to that branch of the State government broad powers which the members say are absolutely necessary if the public health is to be properly safeguarded. In brief, it is proposed that the Board be given full authority over sanitation throughout the State, which is to be divided into 10 districts, and this authority is to be construed so as to empower the Board to compel communities to abate nuisances by the construction of sewerage systems. The occasion for such legislation as explained by Dr. J. S. Fulton, secretary of the Board of Health, is that various towns and other thickly settled portions of the State have been paying little attention to sewerage and thereby have been not only endangering the health of their own people, but also of other communities. For instance, there are towns that let their sewage flow into streams from which other communities have to get their water supply. Dr. Fulton holds that the entire watershed of the State should be under sanitary inspection at all times and that Baltimore as a city is vitally interested in this question, especially since in recent years the suburban territory has been so thickly settled. Instances are said to be conspicuous right in the outskirts of the city where such sanitary supervision is absolutely necessary if the health of the residents of the city as well as of the suburban community itself is to be protected.

Measles in East Orange.

East Orange, N. J.—Ten new cases of measles were reported to the East Orange Board of Health, bringing the total of cases in that city to 125, a record total for any contagious disease in that city.

WATER SUPPLY

Asks for Water Meter to Eliminate Waste.

Trenton, N. J.—An item in the efficiency report of Commissioner Fell is the great waste of water in Trenton. He states that from 1,500,000 to 2,000,000 gallons of water are wasted daily. In his report Fell said: "Recent investigations and tests, made by the department of the use or rather 'abuse' of what is known as the 'hopper closet,' has shown an alarming waste of water through this course. These closets, in most cases, are either running full-head from a half-inch or five-eighth-inch stream, or at the best are only one-half shut off. A very conservative estimate shows that from 1,500,000 to 2,000,000 gallons of water per day are thus wasted. The city loses the cost of pumping and the already overcrowded sewers are taxed to their utmost. The only remedy appears to be the placing of meters on all properties using the 'hopper closet.'"

To Extend Service of Municipal Plants.

Macon, Mo.—Superintendent C. F. Thudium of the Water, Light and Power plants of Macon, has submitted a detailed report to the city council.

The splendid results of the municipal operation of these plants under Supt. Thudium's able supervision, was gratifying to both the council and the Mayor.

The report indicates that the total amount for collection

during 1913 was \$21,292.43, and the expenditures for the same period were \$16,431.32.

The extension of the service was suggested by Superintendent Thudium toward the close of his report, and he said he hoped by midsummer to have connections with several neighboring towns.

Experience has demonstrated that small towns can do better by securing their power and light service from a central station, rather than go to the expense of establishing and operating a home plant.

Third Rate Reduction From Municipal Plant.

Omaha, Neb.—A third reduction of water rates by the board of directors of the metropolitan water district since the plant became public property was made. At the end of the first six months of municipal ownership the rate was reduced 10 per cent. Another 10 per cent. reduction was made at the end of the second six months. The first of this year saw the end of the third six months, but the reduction this time was 13.1-3 per cent., making the rate 23½ cents per 1,000 gallons.

For Monthly Analyses of Water Supply.

Pasadena, Cal.—Pasadena is to go scientifically into the water question, which involves the quality of the local supply. City Chemist Marks is commencing a series of analyses covering each of the different sources of water supply. It is the present plan to make monthly tests of the water through the city chemist's office. Whether these tests will also go into the bacteriology of the water is not stated. The purpose of the tests is to find out from which source, that is, from which well or source of gravity supply, the best water chemically, is being obtained.

Gross Profit of Water System \$54,965.06.

Rome, N. Y.—The gross profit from the Fish Creek water system in 1913 was \$54,695.06. Interest on the sinking fund investment, money in banks and from delinquent consumers brought that sum up to \$56,329.29. The interest on the bonded indebtedness was \$25,148.34, the taxes were \$2,672.88, and the net profit from the water system was \$28,508.07. It is expected that all the outstanding bonds, amounting to about \$600,000, can be retired in about 15 years, thereby freeing the system from existing debt.

Finds Municipally-Operated Plants Profitable.

Brockville, N. Y.—Brockville is congratulating itself upon the successful operation of its municipally-owned light and water plants. The year just closed shows an increase in revenue, which reached the sum of \$120,532. Over and above operating expenses the gross profits amounted to \$28,848. To liquidating debentures, sinking fund and interest, \$19,554 was applied, leaving a net gain of \$9,292 to be carried over next year. The departments contributed \$2,200 into the general treasury of the corporation to assist in the maintenance of streets.

STREET LIGHTING AND POWER

"Municipal Lighting Day" in University of Iowa.

Iowa City, Ia.—City officials in Iowa who are interested in street lighting will meet at Iowa City February 4 to inspect the most modern systems as shown in the department of electrical engineering in the University of Iowa. A program has been arranged by the new extension division of the university for "Municipal Lighting Day" as it will be called. O. E. Klingaman, secretary of the extension division and chief of the bureau of municipal information will have the meeting in charge. One feature of the program already announced is a lecture on "Street Lighting" by Professor A. H. Ford, head of the department of electrical engineering in the state university. Special attention will be given the problems of the smaller cities of the State.

City Plant Sells Power to Traction Company.

Jacksonville, Fla.—At a meeting of the electrical committee of the board of bond trustees, R. E. Wheeler, chairman, together with M. Richardson of the board, the proposition presented to the board meeting by General Manager Hardy Croom of the Jacksonville Traction Company for using power from the city plant from 11 o'clock p. m. until 5 o'clock a. m., was accepted.

In this connection, Mechanical Superintendent E. Murphy, of the Talleyrand avenue plant, explained to the board that these hours, between 11 o'clock at night and 5 o'clock in the morning, formed a period when the demand for power was the very smallest and consequently, the load was the lightest.

Superintendent Murphy stated that any power that could be sold during those hours would mean so much clear profit as a certain portion of the plant had to be operated anyway to furnish the small amount of power that was actually needed throughout the night. He also stated that the selling of any power during that period would be of distinct advantage to the plant and would help materially in reducing the entire cost of operating expenses and went into details that explained his assertions.

Franchises Not Binding.

Kansas City, Kan.—It was announced on good authority recently that the Hutchinson Gas & Fuel Co. will pay the occupation tax of \$200 per year, and not bring any proceedings to resist the emergency levy. This was the only one of the public utility corporations which had shown a disposition of resisting the tax. It is understood that one reason for this change of attitude is the decision of the United States Supreme Court in the Kansas City, Kan., gas case. This decision established that cities of the first class have the absolute right to control the rates charged by utilities and that no contract made since 1903 which fixes absolutely the schedule of rates is a valid contract. The franchise of the local natural gas company was granted in 1907. Under this decision of the United States Supreme Court, although that franchise fixes a rate of 30 cents per thousand for gas, it is not a binding contract, and the city could, with approval of the public utilities commission, make a lower rate, regardless of the franchise. It is said that this, as much as anything, persuaded the gas company not to get into a fight with the city, but rather seek to promote harmony, and the result will be the dropping of any antagonism against the new occupation tax.

Poles to Come Down.

Penn Yan, N. Y.—Ernest R. Bardwell, president of the village, has received from the New York City office of the Bell Telephone Company duplicate contracts which confirm the unofficial agreement orally entered into by the village board and representatives of the telephone company. The agreement provides for the taking down of the telephone and telegraph poles still standing in the business portion of the village and the use by the company of the village conduit.

Will Increase Equipment of Municipal Plant.

Westfield, Conn.—In a town meeting the voters have defeated the proposition to buy electric power from out of town. They have decided to augment the municipal supply by bonding the town for \$25,000 to add to the equipment of the present municipal plant.

Rate Reduction.

Point Pleasant, N. J.—The Point Pleasant Electric Light & Power Company has made some notable reductions in the price of electric current. Hereafter, instead of the straight rate of 18 cents a kilowatt-hour, the company will sell for private lighting at the rate of 12½ cents up to a certain point and 10 cents for current in excess, the point of difference being determined by the size of the installation. Special rates have been made for commercial buildings and for residences where current is used not only for lighting but for cooking, heating and other such purposes. All bills amounting to less than \$15 are subject to a discount of 5 per cent and those totaling more than \$15 to 10 per cent if paid within 10 days.

Kansas City, Kan.—The price of natural gas to consumers in Kansas City hereafter will be 25 cents per thousand cubic feet. The Supreme Court recently held that an act of the Kansas legislature effective May 22, 1911, fixing the rates of all public utilities at the rates in force on January 1, 1911, did not violate the obligation of the franchise of the Wyandotte County Gas Company to furnish gas in Kansas City and that a franchise which entitled

the company to increase its rates from 25 to 27 cents on November 19, 1911, was not a valid one.

Organized Effort to Reduce Rates.

Jersey City, N. J.—Following the fight of the Passaic District for lower gas rates Mayor M. M. Fagan of Jersey City, has planned a conference with the mayors of the other Hudson municipalities for the inauguration of a legal fight before the Public Utility Commission to compel the Public Service Gas Company to cut the gas rates in the Hudson district from 90 cents to 80 cents a thousand cubic feet and also to cut the electric rates. The mayors who had been invited to the conference included Mayor Cooke, of Hoboken; Bert Daly, Bayonne; Charles W. Qugler, of Weehawken; William Raanenbergh, of Union Hill; Daniel Herman of Guttenberg; Joseph A. Riordan, of Harrison; Robert Torrence of Kearny; Cornelius McGlennon, of East Newark; Henry Koch, of Secaucus; Adolph Asmus, of North Bergen; Charles Mohn, of West Hoboken, and Oscar Auf Der Heide of West New York.

FIRE AND POLICE

\$2,870,000 Needed to Modernize Departments.

Philadelphia, Pa.—Declaring that most of the equipment of the Fire Bureau is antiquated and that many improvements are needed for the Police and Electrical Bureaus, Director of Public Safety Porter in his report to Mayor Blankenburg, suggests that the sum of \$2,870,000 be spent for the following requirements:

Motor-driven engines	\$350,000
Reconstructing 19 engines	85,000
New and repairs to trucks	125,000
Combination wagons	275,000
Fuel wagons	35,000
Battalion chiefs cars	15,000
Fireboat	100,000
Patrol wagons	40,000
Captains of police	6,000
Police boats	150,000
Police patrol boats	30,000
House of Correction vans	9,000
Fire signal system	400,000
Police signal system	100,000
Police signal boxes	150,000
New police and firehouses	1,000,000

Patrolmen Must Not Band Together.

Gloucester, Mass.—Gloucester patrolmen will no longer be permitted to band together for mutual protection or otherwise. They must not walk together, they must not talk together, and in general they are to speak only when asked for information. City Marshall Charles S. Marchant has issued a general order to the force requiring that patrolmen must attend strictly to business when they are on duty, keeping their eyes to the front and not stopping to pass the time of day with anyone.

MOTOR VEHICLES

Motor Trucks Remarkably Efficient in Cleveland Blizzard.

Cleveland, O.—Cleveland's survival of the worst blizzard in its history and a food famine, which menaced every resident of the city, showed the remarkable efficiency of the modern motor truck operating under twenty-two inches of snow, with drifts five and six feet high in many prin-

icipal streets, with miles of fallen telegraph poles and tangled masses of live wires, with traffic completely paralyzed, street cars abandoned and others marooning their passengers overnight—under these conditions, the motor trucks of the leading merchants and a few touring cars were the only vehicles able to buck the drifts and bore their way through the heavy blanket of snow.

And nearly all vehicles that could move carried food.

Hundreds of people waded through snow waist deep to reach the depots of the Belle-Vernon-Mapes Dairy Company, the largest milk distributor in Cleveland, and then waited in line for hours to get the milk that was brought in on the White five ton trucks from milk trains that were snow-bound on the outskirts of the city. The accompanying illustration shows one of these White trucks about to start for the city with its load of milk.

Boyd Auto-Truck Received.

Newark, N. J.—The automobile aerial hook-and-ladder truck, which was built for the fire department by the James Boyd & Bro. Co. of Philadelphia, has been received and has been stationed at the quarters of Truck Company No. 9 in Avon avenue. It is driven by gasoline and electricity and cost \$10,000. The acquisition of the new truck makes two of this type in the possession of the department. It is expected that an additional automobile fire engine, which was ordered some time ago, will be received soon.

Tests Exceed Specifications.

Niles, O.—Despite the threatening attitude of the weather, hundreds of Niles citizens came out to witness the new type 12 American La France auto truck which has been purchased for the local fire department. The tests, in each instance, exceeded the specifications and sustained the assertions made by the company. The car is known as a triple combination type carrying 1,000 feet of 2½ in. hose and has a guaranteed pumping capacity of 700 gal. per minute. It is equipped with a 40-gallon tank of chemical, 200 feet of chemical hose, Dayton airless tires, has a wheel base of 156¾ in. and will stand a speed of 60 miles per hour.

London Plans Complete Motorization.

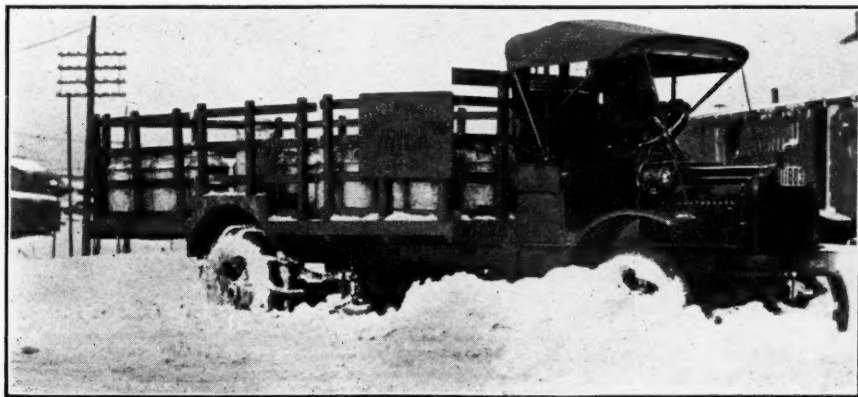
London, Eng.—It is proposed in the next three years to convert the London fire brigade into a motor driven service, at a cost of \$2,000,000 for 249 new pieces of apparatus. Experiments have shown the London officials that a motor pump beats a steam engine, and that motors travel forty miles an hour and pump 500 gallons a minute with a pressure of 120 pounds to the inch. London today has 99 motor appliances and 1,376 firemen to protect 117 square miles. Last year there were 5,760 calls, of which 1,780 were false. The deaths numbered 95. It is estimated that the loss was \$2,137,220.

Test American La France Engine.

Greensboro, N. C.—The new triple combination auto-engine has been tested as to its speed and pumping capacity. Though its stated capacity is 700 gallons per minute, the engine at the test pumped 760 gallons per minute. In responding to an alarm, the city officials, and P. O. Herbert, Southern manager of the American La France Company, the builders of the engine, had an opportunity to gauge the speed of the machine. After covering a distance of about five blocks in a period of 100 seconds, the machine stopped to pick up one man and proceeded on its way at a rate of over 47 miles an hour.

Police Autos Give Good Service.

Worcester, Mass.—Perhaps the best illustration of the stability and efficiency that have been attained in the manufacture of automobiles can be found in Worcester at police station 1 and station 2. Two combination patrol wagons and ambulances are used in the police department and one ambulance. These



WHITE FIVE-TON TRUCK HAULING AFTER BLIZZARD.

cars have been in service for about two years and the aggregate mileage covered by the three cars in that time is over 43,455 miles. The patrol wagon has answered over 11,566 calls and the ambulance has handled over 7,162 cases. These calls have been answered in all kinds of weather and under all sorts of conditions.

GOVERNMENT AND FINANCE

Satisfied With Commission Form of Government.

Bordentown, N. J.—The advocates of Commission Government are elated over the fine showing made by the Board of Commissioners for the six months ending December 31, 1913, particularly over the fact that despite the limited resources available at the time of the adoption of the new form of government they were able to meet their obligations, without borrowing money in anticipation of taxes, something that was never done under the councilmanic government. To increase the efficiency of the departments of Streets and Public Improvements the commissioners, at a recent meeting, have appointed O. B. Wood as general utility man. M. R. Cox has been re-appointed receiver of taxes and treasurer for three years; C. W. Mendenhall, city physician; A. Dougherty, labor master, and H. B. Wells, city solicitor for a term of one year each.

Choose Village Manager.

Glencoe, Ill.—From a list of nearly 200 applicants who responded to an advertisement in a Chicago newspaper the village board of Glencoe has selected H. H. Sherer, of Evanston, to be village manager at a salary of \$150 a month. The duties of the manager will be to purchase supplies for the village, superintend the street cleaning and other departments.

Largest Chicago Budget.

Chicago, Ill.—The largest budget in the history of Chicago has been presented to the city council. The total covered by the ordinance recommended by the finance committee was \$77,211,824. The net appropriations for corporate purposes alone aggregate \$28,918,931.

To Vote on Commission Government.

Coldwater, Mich.—Coldwater City Council ordered an election this spring to vote on a proposition of a city commission form of government. It is expected that the commission form will be adopted by the voters.

Salina, Kan.—There is another chance for Salina to get commission form of government, the city council having passed an ordinance for a special election to vote upon the proposition. The commission form of government was defeated here a couple of years ago by an overwhelming majority.

Commission Government Plan Adopted.

West Plains, Mo.—By a vote of 3 to 1 the citizens of West Plains have adopted the commission form of government. It is the first city in its class in Missouri to adopt the new form of city government. The campaign was brought to a successful issue by the activity of the Commercial Club and the Mayor, who voted for it.

McPherson, Kan.—Commission form of government has been adopted by McPherson in an election. The proposition carried by nearly two to one.

Mertens, Tex.—By unanimous vote Mertens has been rated under the commission form of government. The following officers were elected: E. W. Bookout, Mayor; J. N. Goodman and D. B. Hollingsworth, Commissioners.

STREET CLEANING AND REFUSE DISPOSAL

City Can Collect Garbage at Lower Cost.

Erie, Pa.—Figures showing the work of the garbage department of the city government for the two months from Oct. 21 to Dec. 22, inclusive, have been made public by Mayor Stern. The figures show that the city paid out \$1,557.94 for drivers and laborers during this period, \$390 for the upkeep of the mules, \$200 for the salary of the

superintendent, \$30 for grease, light, heat, etc., at the barn, for freight and shipment of garbage to the plant, \$497.94; for coal consumed at the plant, \$144.42; for oil and grease at the plant, \$15. Wages of firemen at the plant were \$270; wages of foreman at the plant, \$135. This makes a total of \$3,210.30 as the expenses for these two months. Figuring the cost on this ratio, it would make the cost of operation of the plant and the free collection of garbage a little over \$19,000 for a year. Of course, it is expected that the summer months will increase the cost, as there will be much more garbage to be collected in warm weather; but the cheapest rate that was offered the city was \$22,500 for a year. A plan is now being worked out to increase the efficiency of the department by securing more equipment, and it is expected that plans will be perfected in the near future whereby much more garbage can be collected without much more cost. With the increased efficiency of the department, the city will save much money, considering the prices asked by contractors.

Ordinance to Clear Streets.

Connellsville, Pa.—The enactment of an ordinance carrying a drastic penalty for those who fail to promptly remove snow from their walks is expected as the result of the city's experience during the past few days. Scarcely a walk outside of the downtown section can be used with any degree of comfort or safety, and the business district is not entirely free from the criticism. Although there is an existing ordinance which gives the police ample power to require the cleaning of walks, no effort has been taken to enforce it. Complaints during the past few days have been general.

City to Sweep Streets.

Evansville, Ind.—Mayor Benjamin Bosse has decided that the city will do its own street sweeping during the next four years. In pursuance of this policy he bought the street sweeping outfit from Henry Korff, who formerly had the contract and then appointed Korff at a salary of \$1,400 a year to superintend the work. This is regarded as the first stage in a campaign for municipal ownership of various public utilities.

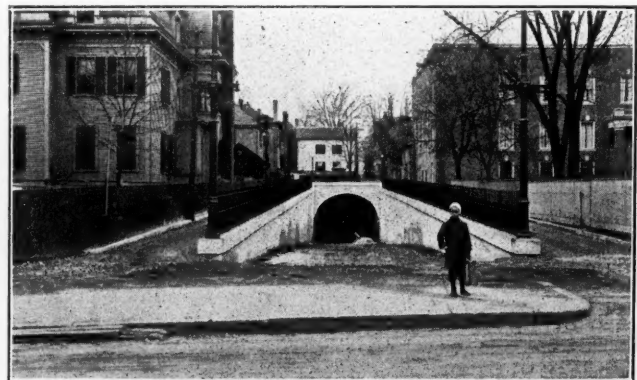
RAPID TRANSIT

Find Municipal Ownership of Railway Successful.

San Francisco, Cal.—San Francisco has found municipal ownership a success. Figures made public by Superintendent T. A. Cashin, of the local city-owned street car lines, show total receipts of \$446,006, representing 8,920,120 passengers carried during 1913 on the Geary street system alone. This line's average daily receipts were \$1,714.95. The cost of operating the line was approximately \$180,000. The Union street line acquired by the city only twenty-one days before the end of the year, made total receipts of \$20,186.10.

Trolley Tunnel.

Providence, R. I.—In constructing the new trolley line, to eliminate the necessity of having cars climb and descend the hill shown in the illustration, the traction company con-



Courtesy Providence Journal.
CONCRETE TROLLEY TUNNEL

structed a concrete tunnel. The picture shows how well the grade of the hill and that of tunnel have been met by the intersecting street.

Oppose Tearing Down Elevated Road.

Boston, Mass.—In the opinion of the Boston Transit commission it is impracticable to tear down the elevated structures in Boston and Charlestown and build subways to Dudley street in one direction and to Sullivan square in the other. The commission has sent a long report to the Legislature, giving facts and figures upon which it bases its conclusions. It was charged by the previous Legislature with the duty of studying this problem and reporting what, in its opinion, ought to be done about the petitions for the removal of the elevated and the building of subways. To carry out that proposition, it says, would cost more than \$13,000,000, and the city of Boston would have to assume the expense, as the Boston Elevated cannot be compelled to bear the cost. The commission says this expense would benefit mainly the owners of abutting property and would not very materially improve the transportation facilities, for the era of elevated construction has not ended.

Co-Operate in Constructing Electric Railway.

Beach, N. D.—At a meeting held here recently, plans were materialized which will result in the construction of the first electric railway in the state to be financed and operated by farmers. The line will run from Baker, Mont., through Dennis, N. D., Carlyle, Alpha, Williams to Beach. The proposition is meeting with enthusiastic endorsement throughout the entire community. An agreement has been entered into whereby farmers within three miles of the road pay \$1 for every acre of land they own; those within five miles 75 cents per acre and those within eight miles 50 cents an acre. The subscriptions are to be void if the road is not in operation within a given period.

MISCELLANEOUS

Ask for \$13,400,000 for Harbor Improvements.

Washington, D. C.—Headed by Mayor John Mitchell, a New York delegation went to Washington to appear before the House Rivers and Harbors Committee in advocacy of river and harbor improvements around New York City, calling for an ultimate expenditure of \$13,400,000. This is the total of the various items in the project recommended by Col. William M. Black of the Army Engineers Corps, for completing the removal of rocks and shoals, and otherwise accommodating the Hudson and East Rivers and their confluent streams to the growing commerce of New York City. The delegation will ask for the immediate appropriation of \$500,000, as provided by the bill introduced on Dec. 22 by Representative Goulden of New York, and for the balance of the project on the continuing contract basis. The project was strongly recommended by Gov. Glynn before the National Rivers and Harbors Congress in Washington in December. The sum of \$500,000 called for by the Goulden bill would be used in the improvement of the East River and the harbor.

Chicago to Erect Municipal Lodging House.

Chicago, Ill.—Among the appropriations contingent on the approval of the bond issue to be voted this year, is the appropriation for \$100,000 providing for a new municipal lodging house. It is the intention of the city to sell the property now used as a municipal lodging house and to apply the proceeds of the sale, together with \$100,000, to the \$10,000 allotted for a women's municipal lodging house, and erect a modern structure. The Mayor said the city could lease a site for a long term of years, erect a building with separate entrances for men and women and have all under one roof.

Departments Must Pay Each Other.

Fort Worth, Tex.—The city commissioners have reached an agreement whereby every department will pay whatever bills it incurs with other departments. The first payment under the agreements was made when the police department paid the water works department \$715 for heat and water furnished the workhouse. Heretofore when no such

agreement was in vogue the infringements of one department on another has been the cause of many protests from different commissioners.

Municipal Playgrounds Increase.

New York, N. Y.—The increase in the number of playgrounds throughout this country and Canada shows the serious attention given by municipalities to recreation work. There are now 642 cities actively interested in the playgrounds movement and many others are alive to the need of establishing play centres. Formerly private philanthropy was largely relied upon, but during 1913 in 111 cities the support was entirely municipal and in 115 cities the maintenance of playgrounds was effected by both municipal and private funds. There are still 110 cities in which work is wholly supported by private benefactors. The total expenditure for recreation work in 1913 was \$5,700,000 in 342 cities where paid supervision obtained. This is a gain of \$1,500,000 over 1913.

City Employees Must Pay Carfare.

Chicago, Ill.—Coincident with the creation of the new public utilities commission by Governor Dunne at Springfield, Chicago, felt the first effect of its loss of home rule when the curtailment of the practice of granting city employees engaged in the transaction of the city's business free street car rides, was announced. This new ruling will cost the city employees hundreds of thousands of dollars yearly.

Mud Slides Wreck Houses.

Seattle, Wash.—Avalanches of mud on the steep hillsides of West Seattle have wrecked two houses and caused the first fatality resulting from the heavy rains which have been falling over western Washington. The hillside between the Seattle city hall and the King county court house, which has given trouble for 25 years, has been slipping rapidly, and all but two of the wooden houses in the two blocks east of the city hall have collapsed. Many points in western Washington have reported damage by washouts and slides, but no considerable loss has been sustained at any one point.

Campaign to Eliminate Billboards in Atlanta, Ga.

Atlanta, Ga.—Mayor Woodward is leading a campaign to rid Atlanta of unsightly fences and billboards. The first opposition encountered was with the Fulton county authorities in connection with a large fence, covered with posters, around the new court house. The Mayor, however, finally won out and the fence is to be taken down.

Municipal Store in Chicago Soon.

Chicago, Ill.—A municipal general store where the necessities of life may be available to those with limited funds will probably be started here soon. The City Council has set aside \$25,000 in the budget for the Unemployed Commission, which will have charge of the store. The goods will be sold at cost to those vouched for by the county agents.

Plan Municipal Market.

Cincinnati, O.—Definite action, looking to the establishment in Cincinnati of a municipal wholesale market has been taken at a meeting, in which Lew Shank, former Mayor of Indianapolis, former Mayor Hunt, ex-City Solicitor Battman and representatives of women's and civic organizations took part. Steps were taken for the formation of a permanent body, to be city-wide in its scope, which will push the movement. The working theory of the organization will be to bring such pressure to bear on the Council as to assure the passage of an ordinance providing for a municipal market, where consumers can buy direct.

Wage Costly War on Mosquitoes.

Newark, N. J.—It took \$65,313.99 to carry on the war against the mosquitoes of Essex County last year, according to figures just submitted by Curtis R. Burnett, treasurer of the Essex County Mosquito Commission. According to the report, forty-four inspectors and ten assistants made 551,472 yard inspections during the year. During the summer 36,670 gallons of oil were used and 67,195 applications were made.

LEGAL NEWS

A Summary and Notes of Recent Decisions— Rulings of Interest to Municipalities

Fire Limits—Ordinance—Validity.

Town of Mansfield v. Herndon.—The adoption by a town Council of an ordinance establishing fire limits is an exercise of the police power, and the courts will not adjudge the ordinance unreasonable and discriminatory unless it is clearly arbitrary.—Supreme Court of Louisiana, 63 S. R., 606.

Change of Street Grade—Damages.

Hoyle et al. v. City of Hickory.—An abutting owner cannot recover for any inconvenience or damage to his property from making a fill in the street in changing the grade under the advice and supervision of the city engineer whose plans were approved in good faith by the city authorities, unless the work was negligently done.—Supreme Court of North Carolina, 80 S. E. R., 254.

Negligence of Independent Contractor.

Karpinski v. Borough of South River.—A corporation having certain charter powers is liable to one injured by the negligence of an independent contractor, exercising such charter powers under contract with such corporation, where the injury resulted from a negligent act of such contractor in the doing of that which could lawfully be done only under such charter powers.—Court of Errors and Appeals of New Jersey, 88 A. R., 1074.

Defective Street—Falling Tree.

Leary v. City of Newburyport.—In an action for injuries from the fall of a tree which a tree warden and his assistants were engaged in cutting down and removing, danger therefrom from the time the roots were cut on Friday until it fell Saturday forenoon was not for a sufficient time to constitute reasonable notice to the city that the tree was a defect in the highway.—Supreme Judicial Court of Massachusetts, 103 N. E. R., 477.

Sidewalks—Defects.

Price v. City of Maryville.—Where plaintiff was injured by stepping on a low place in a sidewalk at night, which was the result of a defect in the walk, and not a mere step-off, resulting from the plan of construction made necessary by surrounding topographical conditions, and the city had notice of the defect, but had failed to repair the same, the city was liable.—Kansas City Court of Appeals, 161 S. W. R., 295.

Water Supply—Contract Against Public Establishment.

Mayor and Aldermen of the City of Vicksburg, Appts., v. W. A. Henson, Receiver of the Vicksburg Waterworks Company.—An exclusive franchise granted by a municipality to a private waterworks company to supply water for public and private use for a definite term does not prevent the municipality from issuing bonds for, and constructing, its own waterworks system, where such system is not to be put in operation until the franchise has expired.—U. S. Supreme Court 34 S. C. R., 95.

Defects in Streets—Duty to Repair.

City of Oakdale v. Sanders' ex'x.—A city is liable for its failure to discharge the duty imposed on it of maintaining the highways in a safe condition for public use, even though the highway was a public thoroughfare at the time of the incorporation of the city and it had never undertaken to repair or reconstruct it, since the rule that a city is liable only for its negligence after undertaking a duty, and not for failure to undertake it, which applies to drainage, does not apply to highways.—Court of Appeals of Kentucky, 159 S. W. R., 812.

Cemeteries—Abandonment—Ordinances—Validity.

Union Cemetery Ass'n et al v. Kansas City et al.—Where the location of a cemetery to a large extent blocked the growth of one part of a city an ordinance, enacted not to protect the public health but to benefit speculators and landowners in that vicinity, which prohibited subsequent burials in the cemetery and would tend to work the de-

struction of the cemetery, is unreasonable, tyrannical, and invalid, particularly where it appeared that the increase in the value of the surrounding property would not correspond to the destruction of the value of the cemetery.—Supreme Court of Missouri, 161 S. W. R., 261.

Special Tax Bill—Ownership of Property.

Barber Asphalt Paving Co. v. Field et al.—A deed which was presumptively not delivered so as to become operative until after the date of its acknowledgment did not, when delivered, relate back to its date or to the date of a prior executed void deed between the parties, at least not for the purpose of conveying title as of those dates so as to uphold an action on a special tax bill against the grantee, who did not otherwise have title at that time.—Kansas City Court of Appeals, Missouri, 161 S. W. R., 364.

Waterworks Bonds—Popular Vote.

Bain v. City of Goldsboro.—Under Act. Sp. Sess. 1913, authorizing the city of Goldsboro to issue bonds for the purpose of completing the enlargement and improvement of its waterworks plant and system, the issuance of such bonds need not be submitted to a popular vote, as the act contemplates no such vote, and Pub. Laws 1911, authorizing a town, city, or municipality, after a majority of the qualified voters thereof have approved and authorized the same, to issue bonds for the construction, maintenance, and operation of a system of waterworks, applies only to municipal corporations whose charters make no special provision for the establishment of water-works.—Supreme Court of North Carolina, 80 S. E. R., 256.

Employees—Salaries.

Smith v. City of New York.—The Board of Aldermen of New York City passed a resolution establishing, in addition to the grades of positions existing, the position of stationary engineer in charge of the Criminal Courts Building. Plaintiff at the time of the passage of the resolution was acting as stationary engineer of the Criminal Courts Building, and had an office with the title of stationary engineer. Held that, as plaintiff was not given any new appointment and the resolution expressly declared that it created a new grade of positions, he was not entitled to the greater compensation provided by the resolution; a promotion to the new office being necessary to entitle him to such compensation.—New York Supreme Court, 114 N. Y. S., 676.

City Advertising—Official Newspaper.

Fagan v. Mayor and Council of City of Hoboken et al.—The statute concerning the publication of municipal advertisements declares "that it shall be lawful" for the common council or governing body, with the consent of the Mayor of any city of the second class, to designate by resolution the official newspaper "in which shall be solely published" all municipal advertisements. Held, that a resolution directing the payment of a bill to a newspaper not designated as an official newspaper in the manner required by the statute did not constitute such newspaper one of the official newspapers in which shall be solely published "all official notices," and that payment for advertisements published in newspapers not official under the statute cannot be made out of public funds.—Court of Errors and Appeals of New Jersey, 88 A. R., 1026.

Street Openings—Assessment of Benefits.

In re Avenue V in Borough of Brooklyn, City of New York.—While the block by block rule of assessing the cost of a street opening on the property benefited is usually a proper method, the value of an improvement on land taken for the street should not be assessed on the abutting property, which acquires no additional benefit from the making of such improvement, but should be assessed on the total area of the property benefited by the opening of the street, especially in view of Greater New York Charter authorizing property owners to convey land to the city for street purposes and exempting their abutting property from assessment for any portion of the expense of opening the residue of the street, except the due and fair proportion of the award made for buildings, which indicates a legislative intent that the cost of taking a building should not generally be assessed on the abutting property.—New York Supreme Court, 144 N. Y. S., 680.

NEWS OF THE SOCIETIES

Calendar of Meetings.

JANUARY 22-24.
INDIANA ENGINEERING SOCIETY.—Annual Meeting, Hotel Severin, Indianapolis, Ind. Charles Brossman, Secretary, 1616 Merchants Bank Building, Indianapolis, Ind.

JANUARY 26-28.
TEXAS GOOD ROADS ASSOCIATION.—Annual Meeting, Fort Worth, Tex.

JANUARY 27-29.
AMERICAN ELECTRIC RAILWAY ASSOCIATION.—Mid Year Meeting and Banquet, New York, N. Y. E. B. Burritt, Secretary-Treasurer, Engineering Societies' Building, 29 West 39th Street, New York, N. Y.

JANUARY 27-29.
WESTERN ASSOCIATION OF ELECTRICAL INSPECTORS.—Ninth Annual Meeting, Cincinnati, O. Wm. S. Boyd, Secretary.

JANUARY 28-30.
ILLINOIS SOCIETY OF ENGINEERS AND SURVEYORS.—Annual Meeting, Peoria, Ill. E. E. R. Tratman, Secretary, 1144 Monadnock Block, Chicago, Ill.

JANUARY 29-31.
CANADIAN SOCIETY OF CIVIL ENGINEERS.—Annual meeting, Montreal, P. Q. Prof. C. H. McLeod, Secretary, 176 Mansfield street, Montreal, Canada.

FEBRUARY 10-11.
CONNECTICUT SOCIETY OF CIVIL ENGINEERS.—Annual Meeting, Hartford, Conn. J. Frederick Jackson, Secretary, Box 1304, New Haven, Conn.

FEBRUARY 10-11.
VIRGINIA ROAD BUILDERS' ASSOCIATION.—Third Annual Meeting, Murphy's Hotel, Richmond, Va. C. L. Scott, Jr., Secretary, Harrisonburg, Va.

FEBRUARY 11-14.
OHIO ENGINEERING SOCIETY.—Annual Meeting, Columbus, O. D. W. Seitz, Secretary, Columbus, O.

FEBRUARY 12-13.
SOUTHEASTERN SANITARY ASSOCIATION.—Second annual meeting, Columbia, S. C. Dr. James A. Hayne, President, Columbia, S. C.

FEBRUARY 12-13.
NORTH DAKOTA SOCIETY OF ENGINEERS.—Annual Convention, Fargo, N. D. E. F. Chandler, Secretary, University of North Dakota, Fargo.

FEBRUARY 12-14.
NATIONAL CONFERENCE ON CONCRETE ROAD BUILDING.—Auditorium Hotel, Chicago, Ill. J. P. Beck, Secretary, 72 West Adams St., Chicago, Ill.

FEBRUARY 16-20.
NATIONAL ASSOCIATION OF CEMENT USERS.—Fourth Annual Convention, Chicago, Ill. Edward E. Krauss, Secretary, Harrison Building, Philadelphia, Pa.

FEBRUARY 18-20.
IOWA ENGINEERING SOCIETY.—Annual Meeting, Council Bluffs, Ia. S. M. Woodward, Secretary, Iowa City, Ia.

FEBRUARY 24-25.
MINNESOTA ENGINEERS' AND SURVEYORS' SOCIETY.—Annual Meeting, St. Paul, Minn. Wm. Danforth, President, 411 Hackney Building, St. Paul, Minn.

FEBRUARY 26-27.
INDIANA SANITARY AND WATER SUPPLY ASSOCIATION.—Seventh annual meeting, Hotel Severin, Indianapolis, Ind. Dr. W. F. King, Secretary, Indianapolis.

Indiana Engineering Society.

The program for the meeting, Hotel Severin, Indianapolis, January 22-24, has been announced by Secretary Charles Brossman, 1616 Merchants Building, Indianapolis, as follows:

THURSDAY, JANUARY 22

1.30 A. M.—Special session for surveyors only. County surveyors' executive session at Hotel Severin. All county surveyors, deputy county surveyors and other surveyors are requested to make it a point to be present. Donald Heaton, chairman.

11.00 A. M.—Meeting of the board of trustees and secretary.

2.00 P. M.—First regular session. Mr. H. O. Garman, president; Chas. Brossman, secretary. Report of secretary, report of executive committee, appointment of committees, president's address, H. O. Garman, Indianapolis;

"The New Ruth Terminal Warehouse and Freight Station," Otto N. Mueller, Indianapolis; "Good Roads," C. A. Kenyon, Indianapolis; "The Construction of Concrete Street and Highway Pavement," C. D. Franks, Chicago; "Brick and Concrete Road Building," A. W. Blunk, Martinsville; "The Testing of Commercial Sands," Prof. H. H. Scofield; "Measurement of Gravel in Piles," Oliver C. Clark, Lebanon; "The Anemo Electric Generator and Its Application to Agriculture," Rollin DeFrees, Reliance, Va.; report of committee on surveying, report of committee on roads and pavements, report of committee on mining, report of committee on legislation, report of committee on architecture. 8.00 p. m. Annual dinner, Hotel Severin. Informal.

FRIDAY, JANUARY 23.

9.00 a. m. "The Economics of Railway Block Signaling," E. D. Cloud, Chicago; "Steam Railway Electrification," Prof. D. D. Ewing, Lafayette; "The New Main Street Bridge at Lafayette, Indiana," Prof. W. K. Hatt, Lafayette; "Bridge Foundations in Gravel Channels," John W. Mueller, Newcastle, Ind.; "Vertical Posts of Bridges and Their Permanent Distortion Due to Secondary Stress," Prof. Albert Smith, Lafayette; "The Common Specifications for Wind Stresses in End Posts of Bridges," Prof. Albert Smith, Lafayette; "The Indiana Bridge Law," D. B. Luten, Indianapolis; report of the committee on steam railways, report of committee on bridges, report of committee on electric railways. 2.00 p. m. "Industrial Engineering," Prof. T. W. Wallace, Lafayette; "Accidents," John D. Riggs, Kankakee, Ill.; "Isolation of B. Coli from Water," Prof. C. N. Hilliard, Lafayette; "The Work of the Indiana Public Utilities Commission," Hon. Thomas Duncan, chairman Indiana Public Utilities Commission; "Public Utility Appraisals," W. J. Huddle, Indianapolis; "Progress in Railway Valuation," DeWitt V. Moore, Chicago; "Appraisal of Indiana Public Utilities," H. O. Garman, Indianapolis; report of committee on mechanical engineering, report of committee on central station light and power, report of committee on electrical engineering. 8.00 p. m. "The Bloomington Sewerage System," Prof. U. S. Hanna, Bloomington; "Sanitary Survey of White River," Mr. Jay A. Craven, Indianapolis; "Construction of Lock and Dam No. 48, Ohio River," Earl A. Smith, Louisville, Ky.; "The Ohio River Survey," G. C. Graeter, Louisville, Ky.; "The Flood at Muncie, Indiana," B. F. Deardoff, Muncie; "Drainage and Flood Conditions in Southern Indiana," E. E. Watts, Princeton; "Lafayette Flood," Prof. R. L. Sackett, Lafayette; "The National Drainage Congress," J. S. Spiker, Vincennes; report of committee on drainage, report of committee on sewerage, report of committee on stream pollution.

SATURDAY, JANUARY 24.

9.00 a. m. "Steel for Reinforcing Concrete," Prof. W. K. Hatt, Lafayette; "Comparative Tests of Concrete Columns," W. K. Eldridge, Indianapolis; "Modern Tendencies in Heating and Ventilation," Prof. C. B. Veal, Lafayette; "Lubricants and Their Tests," Prof. Arthur W. Cole, Lafayette; report of committee on masonry and concrete in Massachusetts, report of committee on materials of construction, report of committee on reinforced concrete for buildings, report of committees, unfinished business, installation of officers, meeting of new board of officers.

American Society of Civil Engineers.

In connection with the annual meetings, special meetings will be held for the consideration of road construction and maintenance. These meetings, three in number, will be held on Friday and Saturday, January 23 and 24, two meetings being held on Friday and one on Saturday. At 10 a. m. Friday morning "Engineering Organizations for Highway Work" will be discussed, the main subject being divided into two parts—"State Highway Engineering Organizations" and "Municipal Highway Engineering Organizations." The discussion on the former will be led by Samuel D. Foster, chief engineer of the Pennsylvania State Highway Department, and on the second by Wm. H. Connell, chief of the Bureau of Highways of Street Cleaning of Philadelphia, Pa. At 2 p. m. on the same day a discussion on "Factors Limiting the Selection of Materials and of Methods in Highway Construction" will be held. Paul E. Green will open the discussion. The discussion at the meeting on Saturday, which will begin at 10 a. m., will be on "Equipment and Methods for Maintaining Bituminous Surfaces and Bituminous Pavements." It will be opened by W. R. Farrington, division engineer, Massachusetts Highway Commission.

Municipal Engineers of the City of New York.

The annual meeting of the Society will be held in the Engineering Societies Building, January 28, 8.15 p. m. The business of the meeting will be the reading of the annual report, the president's address and the canvassing of the ballots for officers. After the business of the meeting has been transacted John W. Leib, vice-president of the New York Edison Company, will deliver an illustrated lecture on "Leonardo du Vinci, Engineer."

International Association of Fire Engineers.

President Haney has called a meeting of the directors for New Orleans, La., on February 23, 1914, to select the time, and to arrange a program of topics for discussion for our annual convention of 1914. The directors invite suggestions, both as to the time for the meeting and subjects to be discussed. Suggestions should be in the hands of the secretary by February 10. James McFall, Roanoke, Va., is secretary.

PERSONALS

Halton, T. Chalkley, consulting engineer, Wilmington, Del., has been engaged by Director Bacharach, Atlantic City, N. J., to supervise the construction of the 48-inch water main running into the city. J. L. Farrabee will act as resident engineer.

Ingham, Harvey, Des Moines, Ia., editor of the Register and Leader, has been re-elected president of the Great White Way Association.

Johnson & Fuller, consulting engineers, sanitary experts, New York, announce that Harold C. Stevens, heretofore their principal assistant engineer, has been admitted to membership in the firm, the other members being George A. Johnson and William B. Fuller.

Powers, Le Grand, chief statistician for finance and municipal statistics, Bureau of the Census, has resigned.

Rehfeld, Paul, formerly connected with the Morgan Engineering Company, has been appointed consulting engineer to County Surveyor V. C. Smith, of Dayton, O., to advise on flood emergency engineering work.

Saunders, George, Muncie, Ind., a gravel road contractor, has been appointed county highway superintendent.

The following city officials have recently been elected or appointed:

West Virginia.

North Viero—Mayor H. L. Matthews.

Stealey Heights—Mayor A. J. West.

Broad Oaks—Mayor Ira Leeson.

Shinnston—Mayor Henry Robinson.

Adamston—Mayor Walter Bumgardner.

Parkersburg—Mayor M. M. Wells.

Fairmont—Mayor Thomas C. Price.

Worthington—Mayor F. C. Robertson.

Woodsdule—Mayor J. V. Braden.

Clm Grove—Mayor J. S. Rine.

Edgwood—Mayor John M. Gibson.

Fulton—Mayor David Paxton.

Woodsdale—Mayor J. N. Dowler.

Patterson—Mayor Samuel F. Chase.

Pleasant Valley—Mayor D. C. List, Jr.

Wanwood—Mayor M. E. Helfenbine.

Spencer, Ind.—Superintendent of roads, Owen county, Holt Pickens.

Parker City, Ind.—County highway superintendent, R. A. Jellison.

Brookville, Ind.—Superintendent of pikes, Frank R. Harder, former county surveyor.

Huntington, Ind.—County superintendent of roads, David Shell.

Martinsville, Ind.—Superintendent of gravel roads, Frank Truax, of Monroe.

Princeton, Ind.—County road superintendent, Joseph P. Yochum.

Fanwood, N. Y.—Mayor W. H. Hoar has appointed the following committees: Audit and finance—chairman, Thomas Norton, Frederick Creesy and O. T. Brown; streets and sidewalks—chairman, Augustus Sheelen, Frederick Creesy and A. I. Nichols; lights, water and fire—chairman, F. G. Erner, A. I. Nichol and O. T. Brown.

Portland, Ind.—Superintendent of water and light, George Nicholson,

Muncie, Ind.—City engineer, Benjamin F. Deardorff, reappointed; fire chief, John E. Carey, reappointed.

Canandaigua, N. Y.—Mayor Turnor has made the following appointment: City clerk, Wm. N. Brooks.

South Amboy, N. J.—Henry Thomas has been elected city engineer; Richard Hillman, street commissioner; Daniel Donlin, water commissioner; H. B. Wade, city electrician. The following committees were appointed: Streets, Slover, Chevalier and Stratton; judiciary, Chevalier, O'Connor and Stratton; lights, Chevalier, Slover and Stratton; fire, Stratton, Chevalier and Slover; public grounds and buildings, Slover, Stratton and Chevalier; finances, Slover, Chevalier and Stratton; taxes and assessments, Stanton, Chevalier and Stratton; poor, Stratton, Slover and Chevalier; police, Chevalier Stratton and Slover; sewers, Slover, Chevalier and Stratton; water, Chevalier, Slover and Stratton; licenses, Stratton, Chevalier and Slover; miscellaneous, Chevalier, Stratton and O'Connor.

Avon, N. J.—Mayor G. B. Goodrich has made these appointments: Clerk, Fredus White; superintendent sewer and water department, Hutson Kettell; superintendent of streets, F. A. Sofield; committees: Finance, W. C. Macavoy; streets, Walter Harris; police, W. H. Spayd; sewer and water, W. D. Farry; lights, W. S. Clayton; fire apparatus, W. H. Spayd and W. Harris.

Rahway, N. J.—H. T. Haliday has been elected street commissioner; George Conger, chief of police; C. H. Lambert, city clerk; D. H. Trembley, president of council.

Westfield, N. J.—Mayor Evans has appointed the following committees: Laws, rules, public safety and convenience, George Taylor, James G. Casey, William R. Davis and Eugene Wilcox; finance, William R. Davis, George Taylor, James G. Casey and Eugene Wilcox; fire department, Robert F. Hohenstein, Robert L. De Camp, Charles M. Affleck and Robert E. Perry; sidewalks, curbs, roads, sewers and water, Robert L. De Camp, Robert F. Hohenstein, Charles M. Affleck and Robert E. Perry; police, Charles M. Affleck, Robert E. Perry, Robert F. Hohenstein and Robert L. De Camp; town property and street lighting, Robert E. Perry, Robert L. De Camp, Robert F. Hohenstein and Charles M. Affleck.

Wilmington, N. C.—The department of water and sewerage has been assigned to Councilman C. C. Loughlin. The department of public affairs has been assigned to Councilman T. W. Wood.

Piqua, O.—Mayor G. W. Lorimer has made the following appointments: Director of public service, Albert Schroeder; director of public safety, George Albert Vaugier; superintendent of water works, William Zimmerman; street supervisor, Harry Lines; clerk of board of control and mayor's clerk, Ray Heater; clerk of water

works department, Miss Anna Thoma; clerk commissioners, Harry D. Hartley, Frank P. Irvin, Sol. Mendelsohn.

Wilmington, Del.—Thomas M. Monahan has been appointed member of the board of park commissioners.

National Park, N. J.—Mayor Edgar Water has appointed William Beers, chief of the fire department, as borough clerk.

Niagara Falls, N. Y.—Mayor Laughlin has made the following appointments: City clerk, Thomas H. Hogan; city engineer, Frederick S. Parkhurst, Jr.; superintendent of streets, John J. Conroy; sealer of weights and measures, Roy B. Sutor; health officer, Edward E. Gillick, M. D.; members of the board of public works (2 years), Charles J. Ohrt, John Leberherz; members of the board of water commissioners (2 years), Alexander J. Porter, Walter McCulloh, James F. Murphy; members of grade crossing commission, Frederick Chormann, 3 years; Mighells B. Butler, 3 years; Peter F. Jenss, 3 years (Prog), James Bengough, 2 years; George G. Shepard, 1 year; member of board of harbor commissioners, Frederick L. Lovelace, 5 years; members of board of park commissioners (2 years), Paul A. Schoellkopf, Nathan Hirsch; secretary of civil service commission, William M. Harrigan; registrar of vital statistics (4 years), Thomas H. Hogan.

Manasquan, N. J.—The following committees were named by Mayor Lefferson: Streets, Lefferson; finance, Moore, Curtis and Hulsart; sidewalks, Reynolds, Wyckoff and Curtis; fire and police, Wyckoff, Herbert and Reynolds; water, Curtis, Reynolds and Wyckoff; lights, Herbert, Hulsart and Moore; sewer, Hulsart, Herbert and Moore.

Freehold, N. J.—John M. Corlies has been re-elected director of freeholders for three years; Charles E. Close, clerk; George D. Cooper, Red Bank, county engineer.

Bradley Beach, N. J.—Boro clerk, W. H. Stephens, reappointed; borough engineer, Mart Rogers; chairman finance committee, Dr. Ten Eyck; chairman street committee, T. C. Barkalow; police committee chairman, Harry Hutchinson; fire and water committee chairman, John Rogers; light committee chairman, Naph Poland.

Metuchen, N. J.—Mayor Thorfin Tait has made these appointments: Chief marshal, Willard B. Hutchinson; borough clerk, Grover Cleveland Lehlein, engineer, C. B. Carman; tree commissioners, George W. Litterst, Dr. A. L. Ellis, George W. Benner; S. F. Sanford was chosen as president of council. These committees of council were selected: Finance, C. B. Veght, E. H. Veen, police, E. H. Veen, S. F. Sanford; streets, E. K. Soper and M. C. Mook; water, William A. Coles, C. B. Veghte; poor, S. F. Sanford, W. A. Coles; light, M. C. Mook, E. K. Soper.

NEW APPLIANCES

WATER TOWER.

Elliptical Bottom Tank Gives More Uniform Pressure and Has More Pleasing Appearance.

The purpose of a water tower is to provide storage for a certain volume of water and furnish pressure. When no such structure is built the pumping plant must be run continuously at fluctuating rates and is subject to severe strains whenever a hydrant is



200,000 GALLON TANK.

turned on or off or a pipe breaks. The storage of a volume of water at an elevation is the safest means for fire protection. It is claimed that there is a saving of fuel of 50 per cent. where a tank is used as compared with pumping directly into the mains. Good practice requires that water should be stored at an elevation of at least 80 feet above the highest point which is to be protected from fire and its capacity should be about 50 gallons per capita.

The Chicago Bridge & Iron Works

has the exclusive right to build the patented elliptical bottom type of tank illustrated.

Among the special features and advantages claimed for this type are the following: Uniformity of pressure: The tank is made of large diameter and shallow depth. All steel. The large riveted steel riser pipe is of sufficient diameter to prevent freezing. Wood frost boxing is unnecessary.

No expansion joint. The large riser pipe is riveted directly to the tank bottom, which is flat at the point of connection and itself takes care of any expansion in the riser pipe.

Self cleaning.—The riser pipe acts as a settling basin for any sand or sediment that may be carried in the water. It may be equipped at the bottom with a blow-off valve, so that the tank can be cleaned out at any time without employing or interrupting its service. The outlet pipe is extended several feet above the bottom.



CLARK VALVE HOUSING.

Pleasing Appearance.—This is a strong recommendation where the structure is located in a prominent place.

CLARK VALVE HOUSINGS Provide Room for Workmen to Pack or Repair Valve.

H. W. Clark Co., Mattoon, Ill., have placed on the market a housing for gate valves which has some of the mechanical features of their meter boxes. The housings are for use over gate valves on water mains under pavements, or elsewhere, and are made strong enough to withstand the heaviest street traffic. The peculiar feature of the original design is a one-sided construction which allows a workman to stand on one side

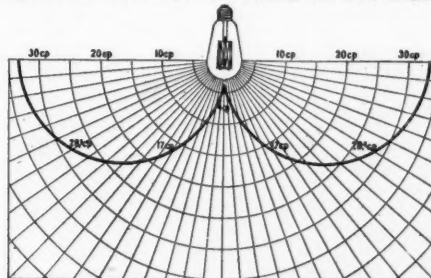


FIG. 1. ORDINARY TUNGSTEN.



LACO PROJECTOR LAMP.

of the valve and allows him ample working space while packing or repairing the valve. Leaking valves should be unknown in a city using these housings. The heavy cover is constructed so that it can't tilt. In the main lid, which is 18 inches in diameter, is a small opening four inches in diameter. This is so small that if open it does not constitute a source of danger to horses or men. The lid is lifted by a unique and convenient mechanism. Security is provided by chaining the lid to the cover. Both ends are securely fastened, being molded in the cast iron. The diameter of the base of the housing is 32 inches. As many extension rings as are desired may be used. They are regular made in sections 12 inches high.

Laco Projector Lamp.

The Laco-Phillips Company, 131 Hudson street, New York City, have placed on the market a tungsten lamp, manufactured in Europe, which on account of its construction gives, it is claimed, four times more useful light with the same current consumption as an ordinary lamp. Heretofore in the construction of tungsten lamps the chief idea has been to overcome the weakness of the filament by substantial design. The Laco tungsten wire is claimed to be so substantial that no special limitations need be put on its shape. Accordingly the filament mounting has been designed solely with a view to lighting efficiency.

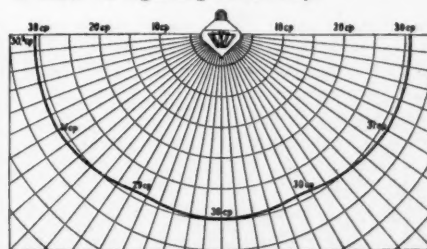


FIG. 2. LACO PROJECTOR.

The diagram Fig. 1 shows that the downward light (the direct and therefore most useful light) of the ordinary 40 watt or 32 candle power tungsten lamp is only four candle power.

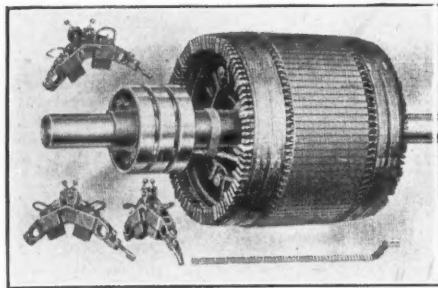
The diagram Figure 2 shows that the conical arrangement of the filaments in the Laco Projector lamp gives a downward light of over 30 candle power and the distribution is absolutely even.

SLIP RING INDUCTION MOTORS.

Western Electric Type M Motors Pick Up Their Load Gradually.

The Western Electric Company, New York City, make alternating current motors of various sizes up to 200 horse power. These motors are claimed to be standards for absolute reliable service, operating at high efficiencies at all loads. They are recommended for use when exceptionally severe service conditions are to be encountered—as, for example, in running hoisting engines and other contractors' machinery or for sewage pumping stations.

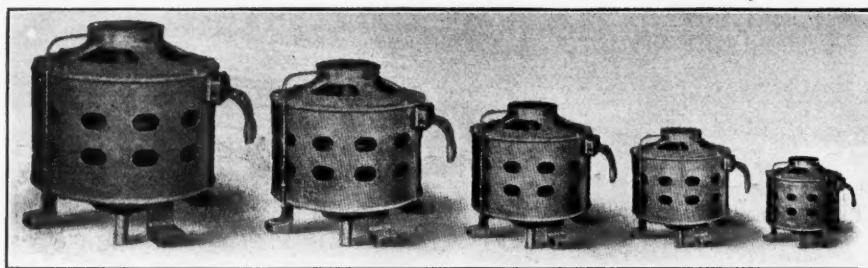
Standard motors are made with various types of rotor windings to meet all conditions of service. The squirrel cage rotor, Form K, is designed for constant speed work when a moderate starting current is not objectionable.



WOUND ROTOR FOR SLIP RING TYPE MOTOR SHOWING BRUSH RIGGING SLIP RING AND BAR WINDING.

This motor is said to operate absolutely without sparking, as there are no moving electrical contacts. This feature has a direct bearing on fire risks.

The Slip Ring motor, Form M, is designed for variable speed service or service requiring at starting an extremely high torque with a minimum starting current, such as for hoist service, for driving centrifugal pumps operating intermittently and for similar service. In this machine the winding of the rotor is not short circuited through copper rings, but in starting is short-circuited through a resistance. When the motor is thrown in circuit a very low starting current is drawn from the line. As the motor comes up to speed resistance is gradually cut out. The windings of the rotor are connected to slip rings, for inserting an external resistance in the rotor circuit, from which leads are taken to the controller, which may be located to suit the convenience of the operator. All slip ring motors will start under heavy load and are adaptable to remote control. Slip ring motors are all furnished with both drum



SKELETON FRAME VERTICAL INDUCTION A. C. MOTORS.

and dial type of controllers. The dial type of controller is designed for capacities up to 50 h. p., while the capacity of the drum type ranges from 25 to 200 h. p.

The Western Electric skeleton frame is a distinct departure from the usual design now on the market. The most

of the rotor or heavy belt strains; to improve the method of ventilation and to avoid the use of unnecessary iron.

Vertical motors with this skeleton frame are convenient for operating pumps. The bearings are of the ball thrust type with top and bottom guide bearings, and the oiling system is self-contained and automatic.

Horizontal motors with skeleton frames have met with particular success when applied to Western Electric hoists. These hoists are of the friction drum type and ordinarily are fitted with mechanical brakes, although solenoid brakes may be used.

A One-Kilowatt Turbo-Generator Lighting Unit.

Light is frequently wanted for limited areas where steam is available but suitable electric power is not, as on contracting operations, small industrial plants, steam launches, etc. To provide a means for supplying electric light under such circumstances, the Westinghouse Electric & Mfg. Company has recently put on the market a small turbo-generator which will operate an arc lamp and a few incandescents at the same time, or about forty 25-watt Mazda lamps, or their equivalent, alone.

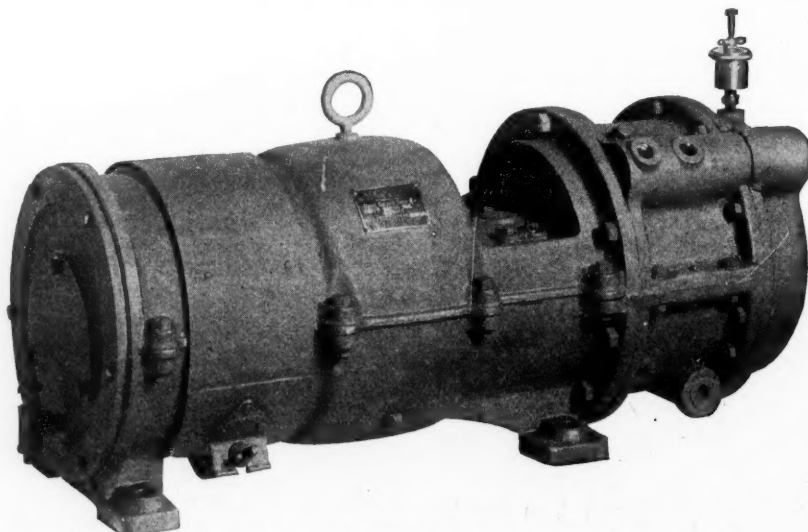
This unit is very compact, being only 3 feet long and 1½ feet high, and can be installed anywhere, provided the unit is kept horizontal. It requires practically no attention when operating; there are no delicate adjustments to make, and all parts are easily accessible.

The turbine and generator are mounted in the same frame. The turbine is



THE OPERATOR CUT THIS 12-INCH STEEL PIPE IN TEN MINUTES WITH A STRICKLAND PIPE CUTTER.

important consideration has been to provide great mechanical strength to insure freedom from vibration or deflection due to unbalanced magnetic pull



GENERATING UNIT FOR FORTY 25-WATT MAZDA LAMPS.

of the impulse type and has a governor which keeps the speed uniform for all variations of load and steam pressure. The full rating of one kilowatt will be developed on 90 pounds steam pressure, and satisfactory operation can be obtained with pressures up to 250 pounds. The overall length is 3 feet, height $1\frac{1}{2}$ feet; the weight is 283 pounds. The rated voltage of the generator is 120 volts.

INDUSTRIAL NEWS

Cast Iron Pipe.—Chicago.—The buying of pipe for municipal work is still backward. Quotations: 4-inch, \$27; 6 to 12-inch, \$25; 16-inch and up, \$24. Birmingham. There is more inquiry than for some time and the expectation is for better business. Quotations: 4-inch, \$22; 6-inch, \$20. San Francisco. With a better market for municipal bond issues the outlook is improving. New York. Manufacturers report a good volume of inquiry for spring delivery. Prices have stiffened. Quotations: 6-inch, \$22 to \$23.

Lead.—Market is dull. Quotations: New York, 4.10c; St. Louis, 4.15c.

Locomotive Crane.—The name of the Browning Engineering Company, Cleveland, O., has been changed to the Browning Company.

Granite.—The annual meeting and banquet of the Barre Granite Manufacturers' Association were held at Montpelier, Vt., the past month. Granite men were present from Barre, East Barre, Northfield, Williamstown and Montpelier, and including the ladies, the attendance was fully 175. At the business meeting the reports indicated that the organization is in a sound financial condition, while the tenor of informal business discussions between the manufacturers confirmed the general impression that the Barre granite industry has had one of the most successful years in all the history of its remarkable development. The following officers were elected: President, E. A. Bugbee, of E. A. Bugbee & Co.; first vice-president, Thomas G. Carswell, of the Carswell-Wetmore Company; second vice-president, Michael H. Kyle, of Montpelier, a member of the Globe Granite Company; secretary-treasurer and clerk, Charles H. Wishart; directors, above officers ex officio, and H. J. M. Jones of Jones Bros., Stephen Rizzi of Rizzi Bros., John Cross of Cross Bros., of Northfield, George H. Hoyt of Hoyt & Lebourveau, H. D. Stevens of Stevens & Jones, and William McDonald of the World Granite Company of East Barre; auditors, John B. Magnaghi of the Presbrey-Coykendall Company and L. C. Beck of Beck & Beck; committee on charges, John P. Corskie of J. P. Corskie & Son, Harry Smith of Smith Bros.' Granite Company and George Robins of Robins Bros.

Crushed Stone.—The Petoskey Crushed Stone Company's plant at Petoskey, Mich., has been closed for the winter after a prosperous year,

during which 170,000 tons of rock were crushed.

Fire Mileage Record.—A good record for tire mileage has been made by the driver of a transfer truck in Washington, D. C. The truck equipped with Goodrich wireless tires was put in service in June, 1911. In January, 1913, the first replacement was made, one rear tire had run 12,900 miles. The second rear tire gave out in the following April with a record of 17,000 miles. The front tires remained in service until May and September, having run 18,800 and 25,300 miles respectively. Since the rear tires were changed the truck has run 12,000 miles and the tires are still good.

Universal Pipe.—The Central Foundry Company, 90 West street, New York, have just issued a new and interesting little booklet showing pictures of many of their prominent Universal Pipe installations throughout the country.

The illustrations are printed from duo-tone plates and present a handsome appearance. Each picture is accompanied by a short description of the use of the pipe in each particular instance. The pipe lines shown are in use under all conceivable conditions, being laid in trenches, above ground, across bridges, in mines. Some of the pictures show short lengths of the pipe laid in curves of comparatively small radius, illustrating in a remarkable manner the extreme flexibility of the Universal joint.

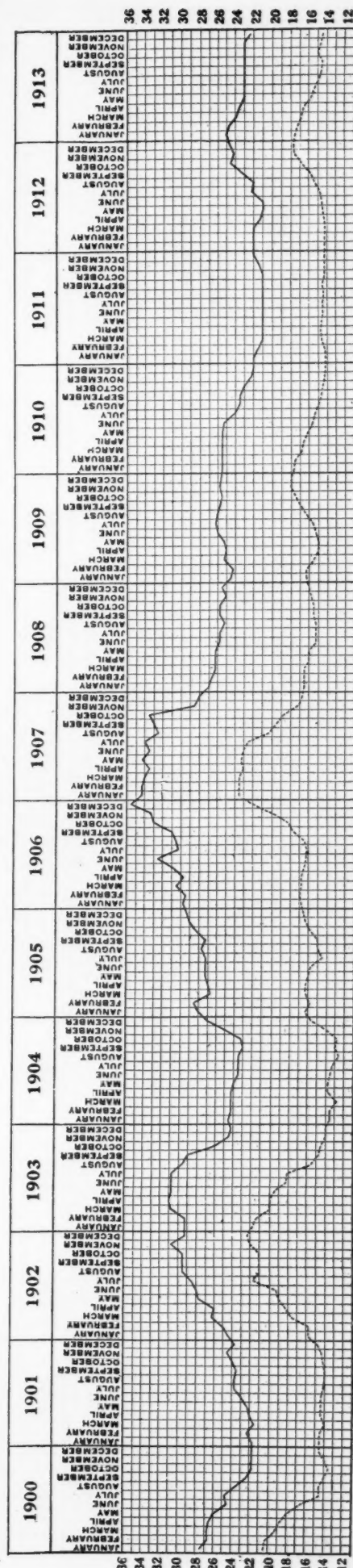
The first edition of this booklet has just come from the press and the Central Foundry Company will be glad to send a copy of it to any one interested.

Concrete Bridge.—The Concrete-Steel Engineering Company, Park Row Building, New York City, has been engaged by the town of Oswegatchie, N. Y., to design and supervise the construction of a concrete bridge over the Oswegatchie River. The Concrete-Steel Engineering Company are owners of the Milan, Von Emperger, Musser and other plants.

BOOK REVIEWS

Kalender für Gesundheits-Techniker. By Herman Recknagel, Diplom-Ingenieur, Berlin. With illustrations and 103 tables. 350 pp.; 4x6 $\frac{1}{2}$ ins. Leather. 4 mk. R. Oldenbourg, Berlin.

This excellent calendar and handbook for sanitary engineers is up to the standard of the other valuable German technical calendars. In addition to the usual logarithmic, trigonometrical tables and physical data the most useful part of the book is devoted to tables and illustrations giving data on air humidity and currents, the conveying of heating in pipes, and water supply. The book is designed especially for engineers who deal with central station heating and ventilation. The diary and blank pages and pocketbook leather cover made a neat and serviceable book.



ADVANCE CONTRACT NEWS

ADVANCED INFORMATION BIDS ASKED FOR

CONTRACTS AWARDED ITEMIZED PRICES

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also correction of any errors discovered.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREETS AND ROADS				
Mont., Missoula	Jan.	24..	Paving Main St., various materials, 8,600 sq. yds.	W. H. Smith, City Clk.
Ind., Terre Haute	11 a.m., Jan.	24..	Constructing national road	N. G. Wallace, Aud.
La., Kentwood	Jan.	25..	Paving 7 miles sidewalks, and keeping in repair for one year	W. A. Houghton, Mayor. City Clerk.
Kan., Concordia	8 p.m., Jan.	26..	Curbing, paving, guttering certain streets.	C. M. Dietterich, City Clk.
Cal., Hemet	Jan.	26..	Improving portions of streets	Bd. City Comrs.
Fla., St. Petersburg	Jan.	26..	Paving, vit. block; curbing with granite, 75,000 feet.	E. Ellis, Clk. of Bd.
Mich., Jackson	1 p.m., Jan.	26..	Improved gravel roads.	St. Rds. Comm., O. E. Weller, Chm.
Md., Baltimore	Jan.	26..	Six sections state highway, 22.2 miles.	Bd. Supvrs.
Cal., Los Angeles	2 p.m., Jan.	26..	Grading, macadamizing, culverts, etc.	Bd. Comrs., Howard Co.
Ind., Kokomo	10 a.m., Jan.	27..	Constructing gravel road.	Bur. Sup. & Accts., Navy Dept., Washington, D. C.
Va., Norfolk	10 a.m., Jan.	27..	Furnishing Trinidad asphalt, paving cement.	J. T. Cowie, Paym. Gen., U.S.N.
D. C., Washington	10 a.m., Jan.	27..	Furnishing paving brick.	Comrs. Talbott Co.
Md., Easton	Noon, Jan.	27..	One mile state aid highway.	W. L. Graft, City Clk.
Va., Roanoke	Noon, Jan.	27..	Macadamizing with binder; constructing concrete curb and gutter	E. L. Voorhees, City Engr.
La., Lafayette	Jan.	27..	Concrete sidewalk, 15 miles.	City Clerk.
la., Creston	8 p.m., Jan.	28..	Constructing and improving sidewalks.	R. K. Compton, Ch. Pav. Com.
Md., Baltimore	Jan.	28..	116,800 sq. yds. sheet asphalt and 13,700 sq. yds. vit. brick; two paving contracts totaling 5½ miles.	F. C. Kiebert, City Clk.
Pa., Meadville	Jan.	28..	Curbing and paving various streets: 63,000 sq. yds. brick, 35,000 sq. yds. Tarvia, 35,000 sq. yds. concrete, 35,000 sq. yds. Dolarway and 37,000 lin. ft. curb.	G. A. Griffin, Co. Aud.
Ind., Noblesville	11 a.m., Jan.	29..	Gravel road	Co. Comrs.
Fla., Tampa	2 p.m., Jan.	30..	Brick pavement, 216,187 sq. yds.; granite or vitrified brick curb, 147,840 lin. ft.	J. H. Carlisle, Comr.
N. Y., Albany	1 p.m., Jan.	30..	Highway improvement in about 18 counties.	Co. Supt. E. A. Howard.
N. Y., Oswego	Jan.	30..	Constructing road; length, 5.81 miles.	N. G. Wallace, Aud.
Ind., Terre Haute	11 a.m., Jan.	31..	Road construction; estimated cost, \$58,000.	R. P. Mason, Co. Engr.
Mich., Escanaba	Jan.	31..	Grading 6½ miles, macadamizing 6.84 miles.	W. L. Lemon, Engr., Clinton.
Ill., Farmer City	Feb.	1..	Brick and concrete paving, 18,000 sq. yds.	A. R. Taylor, Engr., Findlay.
O., Hancock	Feb.	1..	Improving with water-bound macadam; cost \$136,000.	J. W. Forrester, Comr. Sts.
Wis., Fond Du Lac	Feb.	1..	Cement paving, 3 miles.	R. D. Smalley, Co. Engr.
O., Salina	Feb.	1..	Macadam, 4 miles	W. E. Atkinson, St. Hwy. Eng.
La., New Orleans	Noon, Feb.	2..	Highway construction, 4½ miles.	S. R. Sizelove, Aud.
Ind., Kentland	Feb.	2..	Constructing macadam road	J. W. Smith, Aud.
Ind., Williamsport	Feb.	2..	Gravel roads	J. W. Smith, Aud.
Ind., Vevay	Feb.	2..	Road construction	H. L. Knox, Aud.
Ind., Franklin	Feb.	2..	Constructing road with gravel.	L. Drew, Engr.
Ind., Laporte	Feb.	2..	Brick paving; cost, \$800.	Sec. Bd. Bond Trustees.
Fla., Jacksonville	Feb.	2..	Laying asphaltic concrete pavement, 16,762 sq. yds.; vit. block pavement, 33,844 sq. yds.	H. M. Deer, St. Engr.
S. D., Britton	3 p.m., Feb.	2..	Constructing highway	W. C. Hale, City Clk.
Kan., Winfield	5 p.m., Feb.	2..	Brick paving, 32,000 sq. yds.	F. M. Kerrm, Pres. Bd.
La., New Iberia	Feb.	2..	Public highway, 4½ miles	W. W. Friberger, Twp. Clk.
N. J., Union	1 p.m., Feb.	2..	Furnishing, delivering and spreading crushed trap rock.	St. Hwy. Comsn.
Cal., Sacramento	Feb.	2..	Constructing various roads	Bd. Comrs., Blockford Co.
Ind., Hartford City	2 p.m., Feb.	2..	Constructing macadam road.	Comrs., Wash. Co.
Ind., Salem	Feb.	2..	Road construction; estimated cost, \$21,923.40.	W. W. Ackerman, Aud., Fulton Co.
O., Wauseon	1 p.m., Feb.	2..	Hauling and placing gravel on road.	F. E. Brooks, City Clerk.
Kan., Lawrence	Feb.	2..	Brick and concrete pavement.	Bd. Comrs., Jay Co.
Ind., Portland	10 a.m., Feb.	2..	Grading, draining, paving road.	Comrs., Jasper Co.
Ind., Rensselaer	1 p.m., Feb.	3..	Improving stone road.	Comrs., Morgan Co.
Ind., Martinsville	noon, Feb.	3..	Constructing gravel road.	Bd. Comrs., Knox Co.
Ind., Vincennes	Feb.	3..	Constructing gravel roads; estimated cost, about \$32,000.	Comrs., Crawford Co.
Ind., English	1 p.m., Feb.	3..	Grading, draining, paving road.	Comrs., Wabash Co.
Ind., Wabash	1.30 p.m., Feb.	3..	Gravel road improvements.	C. W. Weninger, Aud.
Ind., Knox	Feb.	3..	Road construction	B. B. Engle, Aud.
Ind., Crawfordsville	Feb.	3..	Constructing five gravel roads	Bd. Comrs., Fountain County.
Ind., Jackson	Feb.	3..	Constructing highway	C. J. Northrop, City Clk.
la., Monticello	8 p.m., Feb.	4..	Paving, curb and gutter	C. P. Beard, Aud.
Ind., Evansville	Feb.	5..	Constructing four roads	R. P. Camp, City Clerk.
Iowa, West Union	8 p.m., Feb.	5..	28,000 sq. yds. paving, various materials.	D. Peterson, Aud.
Minn., Waseca	2 p.m., Feb.	6..	Constructing rural highway; estimated cost, \$26,606.20.	Trus., Lincoln Twp.
Iowa, Pocahontas	Feb.	7..	Paving 6 miles road.	Comrs., Delaware County.
Ind., Harrison	10 a.m., Feb.	7..	Constructing gravel road.	A. H. Harris, Boro. Clk.
N. J., Red Bank	8 p.m., Feb.	8..	Street paving, 1,172 yds.	T. Pfeiffer, Ch. Str. Com.
N. J., Alpha	2 p.m., Feb.	9..	Constructing concrete curb and gutter.	C. A. Palmer, Vil. Clk.
O., Shaker Heights	Feb.	9..	Paving roads	T. G. Thorne, City Engr.
Iowa, Clinton	Feb.	10..	Road improvement, various materials.	J. T. Cowan, City Clk.
la., Waukon	Feb.	10..	21,000 sq. yds. vit. brick pavement.	City Clerk.
Iowa, Clinton	Feb.	10..	Paving streets	J. W. Dappert, Engr.
Ill., Taylorsville	Feb.	15..	Nine miles brick pavement on concrete base, cost \$180,000.	W. C. Leye, City Aud.
S. D., Sioux Falls	9 a.m., Feb.	16..	Paving	Comrs., Benton & Newton Co.
Ind., Kentland	1 p.m., Feb.	16..	Constructing macadam road; estimated cost, \$15,599.40.	G. F. McCoy, Aud.
Ind., Plymouth	Feb.	18..	Constructing roads	G. S. Steward, Mayor.
Tex., Mineral Wells	Mar.	1..	Macadam road; cost, \$55,000.	

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
SEWERAGE				
Ill.	Kankakee	9 a.m., Jan. 25	Constructing lateral sanitary sewer	D. Lavery, Pres. Bd. Loc. Impt.
Minn.	Wabasha	Jan. 27	Constructing sewerage system	J. M. Schouweiller, Vil. Rec.
Minn.	Bemidji	2 p.m., Jan. 27	Judicial ditch; total cost, \$11,741	J. L. George, Aud.
Iowa	Clinton	Jan. 27	Constructing sewer	City Clerk.
N. Y.	Brooklyn	Jan. 28	Constructing sanitary and storm sewers	L. H. Pounds, Pres.
Ga.	Andersonville	10 a.m., Jan. 28	Sewer system and cesspool	Depot Q. M., Jeffersonville, Ind.
Ill.	Plano	2 p.m., Jan. 29	Constructing sewer, 67 manholes, 14 flush tanks, and 1 sewer tank	W. M. Foster, Clk. Bd. L. Imps.
Ind.	Logansport	Jan. 29	Ditch, including 8 miles 8 to 24-in. tile	H. M. Bell, Engr.
La.	Grinnell	Jan. 30	12.5 miles of sewers; cost, \$75,000	T. L. Blank, San. Engr.
La.	New Orleans	Jan. 30	Drainage canal work	F. S. Shields, Sec. Sew. Bd.
Ont.	Simcoe	Feb. 1	Lateral sewers and house connections; cost, \$40,000	W. C. McCall, City Clk.
Ark.	Eureka Springs	Feb. 2	Constructing dam, settling basins and two filter units	A. C. Moore, Joplin, Mo.
Iowa	Alden	Feb. 2	Sewers, 11,635 ft; manholes, etc.	H. E. Button, City Clk.
Ill.	Kankakee	2 p.m., Feb. 3	Open ditch work	Comr. of Louis Drain. Dist. No. 1.
N. D.	Lakota	2 p.m., Feb. 3	County drain	J. Franzen, Sec.
Neb.	Scottsbluff	Feb. 3	8 to 10-in. pipe sewers and gravity sewage disposal plant, estimated cost, \$22,000	G. L. Shumway, City Clerk
N. J.	Bogota	8 p.m., Feb. 9	Constructing 4.4 vit. sewers, with two disposal plants, etc.	H. P. Ross, Boro. Clerk.
La.	Clinton	Feb. 10	Sewers	City Clerk.
La.	Lamoni	Feb. 10	Constructing sewer with Imhoff tank, cost \$20,000	J. E. Jones, Twn. Clk.
Wis.	Pond du Lac	Feb. 16	vit. pipe sewer, 1 1/2 miles, 8 to 18-in.	J. F. Honensee, City Clk.
Mont.	Butte	5 p.m., Mar. 1	Sanitary sewer	W. A. Willis, City Clk.
Ark.	Blytheville	Mar. 1	Constructing sanitary sewer; cost, \$60,000	H. C. Houston, Engr., Memphis, Tenn.
WATER SUPPLY				
Minn.	Wabasha	Jan. 27	Complete water works system	J. M. Schouweiller, City Rec.
Pa.	Ambridge	8 p.m., Jan. 28	Furnishing and installing 1,300,000-gal. pump; gas engine or electric motor to operate same; laying 12-in. discharge pipe	Water Comn.
Pa.	Conway	8 p.m., Jan. 29	Furnishing and erecting 50 H.P. gas engine and one 45,000-gal. triplex power pump	Boro. Engr. R. R. Owens.
Mont.	Columbus	Feb. 2	Constructing water works	E. A. Westover, Town Clk.
Ark.	Eureka Springs	Feb. 2	Constructing dam 44 ft. high and 250 ft. long	City Clerk.
Can.	The Pas, N. W. T.	Feb. 3	Constructing water mains	H. H. Elliott, Sec. Treas.
O.	Stuebenville	noon, Feb. 3	Constructing water supply system	Comrs., Jefferson Co.
N. Y.	New York	Feb. 3	Delivering and installing gate and other valves, etc.	C. Strauss, Pr. Bd. Wtr. Sup.
Neb.	Meade	Feb. 5	Installing water works system	City Clerk.
Ky.	Taylorsville	Feb. 7	Water works system	J. H. Reid, Mayor.
Pa.	Meadville	noon, Feb. 11	900 3/4-in., 50 1/2-in., and 50 1-in. water meters; 19 water meters, various sizes	Water and Light Dept.
LIGHTING AND POWER				
N. Y.	Brooklyn	10 a.m., Jan. 27	Search lights, clam-shell and self-dumping coal buckets	P. J. Cowie, Paym. Gen., U.S.N. Washington, D. C.
Pa.	Wilkes-Barre	Jan. 27	Installing 14 circuit switchboard, 20 circuit protector board, etc.	City Clerk.
D. C.	Washington	Jan. 27	40-pair lead sheaf telephone cable, two ventilating blowers	T. J. Cowie, Paym. Gen., U.S.N.
O.	Columbus	Jan. 28	Furn. lamps, cluster light globes, arc lamps, globes, etc.	Bd. Pub. Serv.
Mich.	Wayne	Jan. 28	Motors and electrical equipment for water works system	Water Works Comr.
N. Y.	Albany	Jan. 29	Installing heating, ventilating and vacuum cleaning system	Com. on Pub. Bldgs., Co. Bd. Supvrs.
Can.	Winnipeg	Jan. 29	Electrically-operated switching apparatus and accessories	M. Peterson, Bd. Control, Lt. and Pwr. Dept.
La.	New Orleans	noon, Jan. 30	Electrical machinery, drainage canal work	G. G. Earl, Gen. Supt.
Ill.	Quincy	Feb. 2	Lighting streets, from 1 to 3 years	City Clk.
N. Y.	Albany	Feb. 4	Electric wiring, conduits, fire alarm system, etc.	Bd. Co. Supvrs.
Okl.	Wewoka	Feb. 4	Leasing municipal water and electric light systems	Town Clerk.
FIRE EQUIPMENT				
N. J.	Rumson	Jan. 26	Two motor comb. chemical and hose wagons	City Clerk.
O.	Youngstown	Noon, Jan. 27	One com. engine and hose; one aerial ladder truck	Dir. Pub. Serv.
Pa.	Wilkes-Barre	Jan. 27	Fire alarm equipment	F. H. Gates, City Clerk.
Can.	Weyburn, Sask.	Jan. 29	One comb. chemical and hose wagon, one ladder truck	D. W. Gallagher, City Clk.
Ind.	Muncie	Jan. 31	1,000 ft. of hose	Chief J. A. Casey.
N. Y.	New York	Feb. 2	Fire alarm system for hospital	State Hosp. Comn., Albany.
Fla.	Jacksonville	8 p.m., Feb. 4	Triple combination automobile pump	Frank Richardson, Chmn.
Iowa	Clinton	8 p.m., Feb. 10	Constructing fire station	City Clerk.
N. Y.	New York	3 p.m., Feb. 13	Warehouse, non-interference fire alarm system	Supv. Arch., Treas. Dept., Wash., D. C.
BRIDGES				
Md.	Easton	Jan. 27	Three 30-ft. span bridges	Calbert Co. Comrs.
Neb.	Osceola	4 p.m., Jan. 27	Concrete bridges, culverts, etc., for 1914	R. E. Dearborn, Co. Hwy. Com.
O.	Cleveland	11 a.m., Jan. 28	Constructing concrete culvert	E. G. Krauser, Clk.
Ill.	Chicago	Jan. 29	Superstructure of bridge	Clk. Sanitary Dist.
Tex.	Houston	Feb. 1	Reinforced concrete bridge; cost, \$140,000	Ben. Campbell, Mayor.
Ind.	Valparaiso	Feb. 2	Constructing five bridges	C. A. Blanchly, Co. Aud.
Minn.	Hastings	Feb. 3	Erecting state bridge	Co. Aud.
Tenn.	Chattanooga	Feb. 18	Bridge, \$500,000	T. F. King, Ch. Bridge Comn.
MISCELLANEOUS				
Cal.	Hemet	2 p.m., Jan. 26	Constructing corrugated iron culverts	C. M. Dietterich, City Clk.
Va.	Bedford City	Jan. 26	Post office	Supv. Arch., Wash., D. C.
N. J.	Camden	8 p.m., Jan. 26	Alterations to city hall	G. J. Schneider, Ch. Prop. Com.
Can.	Ottawa	Jan. 26	Constructing additions to fuel testing plant	R. C. Desrochers, Sec. Dept. P. W.
N. Y.	Kings Park	2 p.m., Jan. 26	Vacuum heating system	St. Hosp. Comn., Albany.
Mich.	Detroit	10 a.m., Jan. 27	Furnishing 80,000 tons washed and screened gravel	Comrs., Wayne Co.
Ill.	Chicago	11 a.m., Jan. 27	Furnishing sand for period of one year	L. E. McGann, Comr. Pub. Wks.
Miss.	Clarksdale	Jan. 27	Construction Post Office and Court House	Supv. Arch., Treas. Dept., Wash., D. C.
N. Y.	New York	Jan. 27	Construction syphon	Bd. Water Sup., Munic. Bldg.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
Wis., Madison	Jan.	27..	Foundation work for state capitol.....	L. F. Porter, Sec.
Col., Trinidad		27..	Erecting county court house.....	G. F. Harlan, Ch. Co. Comrs.
D. C., Washington.	10.30 a.m., Jan.	27..	Steel cylinders, shovels, creosote oil, etc.....	Maj. F. C. Boggs, Gen. Pur. Off., Isthmian Canal Comm.
Wash., Puget Sound	10 a.m., Jan.	27..	Cast iron pipes and specials.....	Bur. Sup. & Accounts, Navy Dept., Wash., D. C.
Ia., Muscatine	Jan.	28..	Constructing city hall, cost \$85,000.....	City Recorder.
Ill., Chicago	11 a.m., Jan.	29..	Furnishing and delivering street brooms for one year.....	L. E. McGann, Comr. Pub. Wks.
Ill., Chicago	11 a.m., Jan.	29..	Fish traps for water meters.....	L. E. McGann, Comr. Pub. Wks.
N. S., Halifax	Jan.	30..	One marine type cylindrical boiler.....	G. J. Desbarats, Naval Serv., Ottawa, Ont.
Neb., Scottsbluff	Feb.	1..	Pipe and fire hydrants; cost, \$15,000.....	W. L. Engelstolpe, Engrs.
Mich., St. Joseph	7 p.m., Feb.	3..	Fire department building.....	L. Fillehr, City Clk.
Fla., Key West	7.30 p.m., Feb.	3..	30-ton incinerating plant.....	H. K. Cold, City Clk.
Can., Ottawa	4 p.m., Feb.	3..	About 85 miles welded steel pipe.....	City Clerk.
D. C., Washington.	10.30 a.m., Feb.	3..	Motor driven air compressor, exciter sets, auto transformers, lumber, etc.....	Gen. Pur. Off., Isthmian Canal Com.
Pa., Reading	11 a.m., Feb.	4..	Garbage disposal, optional period.....	City Clerk.
Ill., Bloomington	noon, Feb.	10..	Furnishing and erecting 500 HP. water tube boiler.....	Supv. Arch., Wash., D. C.
Mo., Booneville	3 p.m., Feb.	11..	Post office.....	J. J. Quinn, City Controller.
D. C., Washington	Feb.	11..	Installing automatic weighing and recording scale.....	H. S. Hamlin, Asst. Sec., Treas. Dept.
Mo., Boonville	Feb.	11..	Constructing post office.....	Supv. Arch., Treas. Dept., Washington, D. C.
D. C., Washington	11 a.m., Feb.	14..	Two motor driven fire pumps; cost, \$14,000.....	R. H. Stanford, Bur. Yds. & Docks, Navy Dept.
Cal., Berkeley	Feb.	18..	Constructing post office.....	Supv. Arch., Treas. Dept., Washington, D. C.
La., New Orleans	Feb.	26..	Brick building for pumping station.....	Sewage & Water Board.
Tex., Kingsville	noon, Mar.	1..	Erecting fireproof court house and hospital.....	Comrs. Court of Kleburg Co.
N. C., Raleigh	Mar.	2..	Erecting court house; cost, \$224,000.....	City Clerk.

STREETS AND ROADS

Douglas, Ariz.—The Central highway, through central portion of Sulphur Spring valley, which will serve many times greater number of people than any other road through proposed section has been given official approval of County Board of Supervisors.

Auburn, Cal.—Board of Supervisors has decided that it will buy \$55,000 of State road bonds of \$100,000 necessary to build road from Roseville to Auburn, provided that at least \$40,000 is subscribed by citizens of Placer County.

Pasadena, Cal.—Ordinance has been passed for improvement of various streets.

Pasadena, Cal.—Opening of Holly st. is being planned.

Pasadena, Cal.—Opening of Forest Ave. is being planned.

Pasadena, Cal.—Resolutions have been adopted for improvement of various streets.

Pomona, Cal.—It is understood that contract for work of paving First St. from Garey to Park Aves., is already open for bids.

San Diego, Cal.—Contracts shortly will be let for 12 miles of street paving. According to J. Murray Loop, of street superintendent's office, proceedings ordering \$500,000 worth of work have passed Council and there is nothing to stop further progress. Most of streets to be paved with asphalt are in downtown section and in district adjacent to Balboa park. Within next month or two contracts will be ready to be let by Council.

San Diego, Cal.—County funds to amount of \$400,000 are to be used to purchase state highway bonds on agreement that State Highway Commission will use money toward completing lower state highway in San Diego County, if no legal difficulties are encountered. Supervisors have tentatively agreed to purchase amount of bonds at par that will be required to complete road from Los Flores to San Diego, and resolution to that effect will be considered by supervisors.

San Francisco, Cal.—Improvement of Russian Hill is being planned.

Willows, Cal.—Chief Engineer A. B. Fletcher of Highway Commission has estimated total cost of highway from Benicia to Red Bluff at \$1,283,500.

Wilmington, Del.—William P. Bancroft has asked Sewer Department to pave 6th St. from Bayard Ave. to Ferris St.; 5th St. from Bayard Ave. to Ferris St.; Ferris St. from 4th to 7th St.; Bayard Ave. from 4th to 5th St., and 12th St. from end of present paving on south side of street to B. & O. Railroad bridge. Mr. Bancroft was told that matter would be referred to Councilmen from 12th and 5th Wards.

Wilmington, Del.—Residents of 7th Ward are petitioning for street improvements.

Wilmington, Del.—Tentative list of streets in their respective wards that need paving has been made up by mem-

bers of City Council and list was submitted to Street and Sewer Department at once.

Washington, D. C.—Hillsdale citizens are urging Commissioners to recommend to Congress passing of bill for grading and improving of Sheridan Rd.

Orlando, Fla.—Orange County is soon to expend \$600,000 for vitrified brick roads. City of Orlando will expend \$200,000 for same purpose. Seminole County will expend large amount. Volusia County and Osceola County will each expend several hundred thousand dollars for similar purposes.

Atlanta, Ga.—Appropriation of \$129,000 has been asked for to complete adjustment of adjacent streets to conform to new grade of Whitehall St.

Atlanta, Ga.—It is generally believed that finance committee of City Council will appropriate \$25,000 for widening of Peach tree St., between Grand Alley and Harris St., known as the "neck of the bottle."

Alton, Ill.—Bids on four contracts have been opened amounting in all to 22 bids. Second st. sidewalk contract will undoubtedly be secured by John Strubel on account of his low bid of 16 1/2 cts. on sidewalks.

Bids in order of their opening were as follows: Charles Degenhardt, 13th, from Alby to Langdon; paving brick, \$1.61 1/2, curb and guttering, 57 1/2 c.; Degenhardt, Langdon, 12th to 13th, paving, brick, \$1.60 1/2, curb and guttering, 57 c.; Degenhardt, 9th and Alby to Langdon, paving, brick, \$1.62, new curbing, 60 c.; curb reset, 15 c.; Degenhardt, 2d st, sidewalk, 23 1/2 c., curbing, 93 c.

U. S. Nixon and Thomas Morfoot, Langdon, 12th to 13th, brick, \$1.63, curb and guttering, 49 1/2 c.; Nixon and Morfoot, 13th, Henry to Langdon, brick, \$1.63, curbing and guttering, 49 1/2 c.; Nixon and Morfoot, 9th from Alby to Langdon, brick, \$1.63 1/2, new curbing, 55 c., curb reset, 60 c.

Stafford & Miller, 13th, from Henry to Langdon, brick, \$1.60, curbing and guttering, 50 c.; Stafford & Miller, 9th, from Alby to Langdon, brick, \$1.60, curb and guttering, 50 c., new curb, 35 c., reset, 14 c.; Stafford & Miller, Langdon, 12th to 13th, brick, \$1.71, curbing and guttering, 50 c.

H. H. Beiser Concrete Co., 2d st. sidewalk, 23 c.; curbing, 67 c.; John Strubel, 2d st., sidewalk, 16 1/2 c., curbing, 50 c.; Strubel, 9th st., Alby to Langdon, paving, \$1.69, curbing and guttering, 55 c., new curb, 54 c., reset, 12 c.

David Ryan, 2d st., sidewalk, 18 1/2 c., curbing, 49 c.

H. R. Wolf, Langdon, 12th to 13th st., brick, \$1.63, curbing, 53 c.; H. R. Wolf, 13th st., Henry to Langdon, brick, \$1.60, curbing, 53 c.; H. R. Wolf, 9th st., Alby to Langdon, paving, brick, \$1.64, curbing and guttering, 56 c., new curb, 58 c., reset, 14 c.

John Strubel, 13th st., Henry to Langdon, brick, \$1.58 1/2, curbing, 55 c.

Brooker & Grabbe, 2d, Henry to Langdon, brick, \$1.65, curbing, 55 c.

Henry Elfen, 13th st. to 13th, paving, \$1.58 1/2, curbing and guttering, 60 c.

William & Joe Beiser, 2d st. sidewalk, 22 1/2 c., curbing and guttering, 65 c.

John Strubel, Langdon, 12th to 13th sts., paving, \$1.58 1/2, curbing and guttering, 55 c.

Strubel also was lowest bidder on the Langdon street job and Stafford & Miller were lowest bidders on 13th and 9th st. paving jobs.

Chicago, Ill.—Plans for beautification of Rogers Park have been discussed at meeting of Rogers Park Town Planning Association. Plan contemplates development of main streets of Rogers Park establishment of business center and park and building of two crosstown boulevards.

Freeport, Ill.—Improvement of Lincoln ave. is being planned. City Engineer Hepner has outlined comprehensive plan for boulevarding of this street. If adopted, it will be only real boulevard that Freeport can boast of. Distance is 1,800 ft. City engineer's plan is for parkway 15 ft. wide in center, with driveway of 18 ft. on both sides.

Hartford City, Ind.—Bids will be received until noon, Feb. 2, for purchase of bonds in sum of \$12,600 for Stotler No. 2 Road in Jackson Township. G. H. Newbauer is Treasurer Blackford Co.

Portland, Ind.—Three petitions have been received by Council asking for brick street improvement.

Cherokee, Ia.—Hearing on resolution of necessity on street paving work to be done this year will come up for hearing objections, etc., on Jan. 26.

Colleyville, Kan.—Movement is on foot for construction of macadam road 22 ft. wide at approximate cost of \$2,200 per mile.

Pittsburg, Kan.—Resolution has been adopted for improvement of 6th st. from Pine to Georgia sts. by grading and paving with either vitrified brick on a 4-in. concrete base or a double course of brick, class A, B or C; also by curbing and guttering. Leonard Boyd is City Clerk.

Jeffersonville, Ky.—Issue of \$15,000 worth of free gravel road bonds has been sold to Greed, Elliott & Harrison, a brokerage firm of Indianapolis, by County Treasurer John R. Scott to secure funds for construction of Jacobs road in Utica Township.

Louisville, Ky.—Needed street reconstruction amounting to \$540,000 is contained in list of proposed work submitted to Board of Public Works by City Engineer Lyman. Between now and Aug. 31, end of fiscal year, board will have available about \$215,000 for reconstruction of streets. After trip over streets recommended in City Engineer Lyman's list, board members will select streets most in need of immediate attention. Street construction and repair appropriation for 1914 is approximately \$310,000. Of this amount about \$100,000 has either been spent or is under contract. This makes it unavailable for any of the streets put in Board of Public Works program to be arranged from City Engineer's list. Board expects to announce its program

in about a week so that bids can be taken and contracts let for beginning of work with close of winter.

Baltimore, Md.—Governor Goldsborough has sent special message to Legislature asking for prompt action in appropriating \$6,000,000 for building and maintenance of good roads.

Baltimore, Md.—Indications are that Legislature will shortly have before it bill to authorize issuing of \$6,000,000 of bonds for continuance of State road building, as asked for by Roads Commission and Governor.

Bay City, Mich.—Resolution has been offered by several Aldermen that City Engineer be requested to prepare estimates on cost of 30-ft. asphalt pavement from 1st St. on Madison to Columbus Ave., also cost of parking similar to that of 5th St., also for same from Columbus Ave. south on Madison to 22d St., thence on Kosciuszko St. Resolution prevailed.

Adrian, Mich.—Proposal asking Lenawee County Supervisors to approve the preparation of plans by State Highway Commission for trunk highway from Adrian to Bay City has been placed before county solons by Saginaw representatives who are supporting the movement. New highway would pass through counties of Lenawee, Washtenaw, Livingston, Shiawassee, Genesee, Saginaw, Midland and Bay. It would also connect with following cities and villages: Adrian, Tecumseh, Manchester, Chelsea, Pinckney, Howell, Durand, Flushing, Saginaw and Bay City. It is stated that all counties along route will be asked to take action as early as possible.

Grand Rapids, Mich.—Upon suggestion of Supervisor Krigel of Caledonia Township, Committee on Roads and Bridges of Board of Supervisors is preparing resolution to be presented to legislature at next session providing for construction of all bridges over meandering streams by State under State supervision. Resolution is of state wide importance and authors of movement intend to make strong bid for its adoption. Krigel's requisition for appropriation of \$5,500 for bridge over Thornapple River at Caledonia has been granted.

McMillan, Mich.—Luce County voters are voting at special election to decide question of bonding county for \$100,000 for construction of good roads. A network of country highways is planned, if proposition carries.

Duluth, Minn.—Improvement of West Superior St. between 15th and 25th Aves. has been ordered. Highway will be paved with brick on concrete base and estimated cost is \$65,343.

Duluth, Minn.—Commissioner Roderick Murchison, head of works division, in conference with other members of City Council has decided to improve West Superior St., between 15th and 25th Aves., with brick pavement on concrete base. Figures of engineer showed that difference in cost of complete new pavement and of brick laid on present macadam as base was too slight to warrant latter job. Estimates for brick paving on concrete base fixed \$137.50 as the cost of each 25-foot lot, while cost for brick laid on tar macadam would be \$100 per 25-foot lot, or only \$20 less.

Stillwater, Minn.—Board of County Commissioners of Washington County asks State Highway Commission for \$47,000 to aid in building state highways this year. Of that sum \$35,000 is desired to be used on state highway leading from Twin Cities to Duluth. Chairman J. W. Houle and County Auditor N. N. Nelson were named to confer with State Highway Commission as to Washington County road needs.

Gulfport, Miss.—It has been announced in Gulfport that good roads bill, which will provide for construction of state highways from Corinth and Meridian and from Meridian to Gulfport, Vicksburg and Jackson, will be introduced early in session of legislature.

Jackson, Miss.—The Hinds County Board of Supervisors, at their January session, have let contracts for working of public roads for three years. Work extends over some 600 miles of highway, at varying prices, according to character of county topographically and otherwise.

Meridian, Miss.—Board of Supervisors of Lauderdale County have sold another good roads bond issue of \$100,000 for supervisor's district number one for use in this district. Purchase was made by Hoekler & Cummings, of Toledo, Ohio, for par and accrued interest, bonds to bear 5½ per cent. Bonds are to be delivered to National Bank of Commerce at Toledo, Ohio.

Hannibal, Mo.—Col. F. W. Buffum, State Highway Commissioner, believes that

proposed highway along Mississippi River, running inside bluffs along the Missouri side, would be feasible and it receives his approval.

Kansas City, Mo.—Plans for formulation of definite requests for federal aid in building of improved roads have been mapped out.

St. Joseph, Mo.—Ordinance has been passed to provide for grading Franklin St. from Fourth to Fifth Sts. T. E. Gates is City Clk.

Flemington, N. J.—Common Council has approved Prospect Hill route for Frenchtown-Flemington macadam road to enter borough. Other route under consideration was through Mine St. Borough will provide right of way and pay 10 per cent. of cost of construction to borough line. The Hunterdon County Board of Freeholders is expected to ask for bids for construction of road, which will be six miles long and connect with Frenchtown section, which is nearly completed.

South Orange, N. J.—Ordinance is being considered for improvement of Summit ave.

Trenton, N. J.—It is almost certain that one of roads to be improved this year is River Road, from this city to Hunterdon County line.

Newburgh, N. Y.—State Highway Commissioner will let 18 construction and 9 repair contracts on January 30. The construction contracts are in counties of Alleghany, Broome, Cattaraugus, Chenango, Cortland, Monroe, Niagara, Oneida, Otsego, Orleans, Oswego, Otsego and Tioga. The repair contracts are in the counties of Albany, Genesee, Monroe, Ontario, Orleans, Rockland, Saratoga and Westchester.

Norwich, N. Y.—At special meeting of Village Trustees, Mr. Delaney, representing the State Highway Department, submitted plans and specifications for proposed highway between this village and Oxford. Proposition made to officials of Norwich was that State would construct 16 feet of brick pavement on South Broad St., from American Ave. to village limits, if village would construct remainder of width of street. Mr. Delaney also visited Oxford and submitted plans for that end of road and they were unanimously accepted. County Superintendent of Highways of Oxford has accepted plans. Mr. Delaney has returned to Albany and full 10 miles of highway south of this village will be advertised for first letting of contracts in few weeks.

Riverhead, L. I., N. Y.—Suffolk Supervisors have voted to send committee to Albany at once to urge immediate construction of State and county highway from Amityville to Huntington, to pass directly by new School of Agriculture property, 5½ miles long; another road from East Islip to Smithtown Road; another from Southampton Village line west to connect with that part of Route 35 that will end at Westhampton when built; and also to urge immediate building of that part of Route 35 that runs from Quogue-Riverhead road junction to Westhampton.

Granite Falls, N. C.—Road bonds which were voted some time ago are now on the market and Commissioners expect to start road work in early spring.

Hendersonville, N. C.—An expenditure estimated at approximately \$300,000 for permanent improvements is scheduled for Hendersonville and vicinity for year of 1914. These improvements will be in way of road building, street paving, hotels and residences.

Cincinnati, O.—County Commissioners have approved plans and specifications for improvement of Wooster Pike, from Bamford Hills to Little Miami River at Milford, estimated to cost \$18,779.69. The Board has decided to ask State Highway Commission to allow half of 1914 appropriation in addition to appropriation of \$8,742.34, making total of about \$22,000 toward cost of improving Dunlap-Springdale Road, to be built at joint cost of State and county. Estimated cost of improvement is \$43,160.

Goshen, O.—Bonds in sum of \$50,000 have been sold and township trustees will shortly award contracts for improvement of road between Damascus and Garfield. The improvement will be by brick paving not less than 16 ft. in width.

Salem, O.—Without a dissenting vote good road enthusiasts have passed resolutions indorsing movement looking to issuance of \$800,000 in bonds by county for construction of roads. Petitions asking County Court to call special election will be put into circulation immediately.

Sandusky, O.—County Commissioners have taken first definite steps toward the

building of lake shore highway, or main market road No. 13, as it is now known, by designating two miles of road in Berlin Township for construction under State aid plan.

Toledo, O.—Estimate of repair work on 35 miles of stone road in Lucas County to be done during year at cost of \$95,231, has been submitted by Arthur J. Hatch, County Surveyor, to Board of Commissioners for approval. Mr. Hatch had until April 1 to submit estimate, but work was completed early in order that bond sale and bids may be advertised and disposed of, that work can be started as soon as weather will permit. Estimate covers work on the following roads: Detroit Ave., Michigan Ave., Monroe St., Central Ave., Lewis Ave., Heller, Dorr St., Dorr St. extension and the Coon road. The largest expenditures will be on the Monroe St., Central Ave. and Lewis Ave. roads.

Youngstown, O.—Resolution has been adopted to pave Haseltine Ave., from Wilson Ave. to Hickory St., to pave Himrod Ave., from Truesdale Ave. to Oak St., and to pave Halleck St., from Logan Ave. to Elm St.

St. Helena, Ore.—Large and extensive improvements to streets are figured for 1914.

Connellsville, Pa.—County Commissioners have directed county engineer to draw up plans for new walk on south side of Yough bridge with ultimate object of erecting this much needed improvement. When plans are drawn up commissioners will go over them and then award contract.

Erie, Pa.—Ordinances have been adopted for improvement of various streets.

Waltham, Tenn.—Morgan County will vote on question of issuing \$300,000 of pike bonds on March 28 and matter is already causing considerable talk among the people generally.

Harrisburg, Pa.—A committee to draw up plan to submit to next legislature for systematic road improvement in Pennsylvania has been named at conference of men of various parties and organizations held here. The meeting was called by Pennsylvania Good Roads Association.

Harrisburg, Pa.—Application to have Maclay st. paved from railroad to Cameron st. to make clean stretch of driveway into grounds of State Hospital for Insane has been made by Dr. H. L. Orth, superintendent of institution.

Meadville, Pa.—City expects to lay five miles of paving this coming summer. There will be approximately 70,000 sq. yds. of paving laid in 11 streets which it is planned to improve. Style of paving block which city is accustomed to use will average about 40 blocks to the sq. yd., which, it will be seen, means 2,800,000 blocks for entire job.

Charleston, S. C.—Petition has been presented for asphaltic concrete roadway on Savage St., between Broad and Tradd, also for suitable sidewalks on both sides of street.

Spartansburg, S. C.—It has been decided by council to start work on South Converse St., from railroad to Park Ave. Mr. Tull, city engineer, was requested to make estimate of actual cost of paving North Church, South Church and East Main Sts. before any other streets are ordered paved.

Sioux Falls, S. D.—City Commissioners have adopted resolution to pave Phillips Ave., between Seventh and Thirteenth Sts. Specifications of city engineer with regard to paving provide for bidders on seven different kinds of paving material, choice of material to be made by property owners on avenue when bids are received.

Sioux Falls, S. D.—Paving of Duluth ave. from Third to Twelfth sts. has been petitioned for. Bids will also be advertised for paving of Phillips ave. between 7th and 18th sts.

Nashville, Tenn.—Provision having been made by ordinance for paving or reconstruction of 44 streets of city under abutting property tax provisions of city charter, J. M. Wilkerson, Commissioner of Streets, has stated that he expected contracts for building of these streets would be awarded so that actual work might be begun on streets about 60 days hence.

Bonham, Tex.—Good roads bond issue of \$300,000 will be voted on in this precinct Jan. 24.

Brenham, Tex.—A movement is on foot to have Commissioners' Court order bond election for purpose of building better roads in Precinct No. 3, in Washington County, which embraces city of Brenham. Plan is to issue bonds to amount of \$350,000, and there are about 100 miles of road to be built or improved in section mentioned.

Granfile Gap, Tex.—It has been voted to launch campaign at once for \$30,000 bonds with which to construct good roads in this precinct of Bosque County.

Clarksville, Tex.—Complying with petition filed with legally required number of signers, Commissioners' Court has ordered election to be held on Feb. 21 to determine if Precinct No. 1, which includes city of Clarksville, should issue road bonds to amount of \$200,000.

Dallas, Tex.—Property owners having filed petition for immediate undertaking of paving work on Carroll and Thomas Aves., Board of Municipal Commissioners have instructed City Secretary to reply that as soon as culverts on Thomas and Carroll, crossing Mill Creek, are completed, paving will begin. Materials are ready for prompt carrying out of plans.

Denton, Tex.—Petition asking for \$300,000 issue for roads has been presented to Commissioners' Court and will be acted on shortly. The district covers parts of Justice Precincts No. 1 (Denton), 6 (Little Elm) and 7 (Aubrey).

Denton, Tex.—Commissioners' Court has set Feb. 21 as date for holding bond election to determine on issue of \$900,000 in road bonds in special road district comprising parts of Justices Precincts Nos. 1, 6 and 7. One hundred miles of road, covering ten principal roads out of Denton, are named in petition on which order was made to be improved.

Fort Worth, Tex.—In judgment of committee that went over roads, the preferable continuation of Meridian road from Fort Worth south to Johnson County and from that county line to Cleburne in subcardinal road out of Fort Worth, running west of Baptist Theological Seminary to Burleson and Cleburne is by prairie route. The prairie route is via Burleson and then over prairie to connection with Tarrant subcardinal road southwest out of Fort Worth. That is seventeen miles and with Tarrant County end fourteen miles, there would be a possible good road, of thirty-one miles into Cleburne from Fort Worth. About seven miles of that line in Johnson County would have to be improved.

Fredericksburg, Tex.—Plans are being devised for building good roads in county.

Princeton, Tex.—A good roads campaign has been started, and meeting was held and steps taken to present petition to Commissioners' Court for bond issue election. In that district, which will join McKinney district on east and Farmersville on west, issue of probably \$125,000 will be asked for, with which to construct about 30 to 35 miles of road.

San Antonio, Tex.—Endorsement has been given to every street widening and opening project by City Council, and, in addition, Council has pledged itself to appropriate out of budgets for 1914-1915 and 1915-1916 fiscal years sum sufficient to guarantee carrying out of all plans now pending and plans that may be submitted later.

Sherman, Tex.—Bond issue of \$5,000 for sidewalks and \$5,000 for streets are being considered.

Temple, Tex.—At special election held in Road District No. 4, Bell County, which comprises 240 acres of territory included in Tal-Coe and Temple Heights additions to city of Temple, but outside corporate limits, vote stood 28 for bond issue of \$15,000 and 2 against. There are 34 voters in district. This is said to be smallest road district organized in Texas.

Yorktown, Tex.—City Council of Yorktown is preparing plans for graveling of street leading to Sap depot. Largest amount of traffic is handled on this street and its immediate repair has become imperative. According to present plans, gravel is to be laid to depth of 4 ins. for distance of five blocks.

Salt Lake City, Utah.—Improvements estimated at \$123,000 and new equipment to cost about \$10,000 are planned by Commissioner of Streets and Public Improvements for 1914. Among new improvements that have been authorized for street department are following: Paving of Ninth South from Fifth East to Ninth East at a cost of \$20,000; paving of Second South from Sixth West to the river at a cost of \$28,000; paving of one block on W. Fourth South at a cost of \$3,000; Fifth South storm sewer, \$4,500; covering of Ninth South canal for four blocks at cost of \$20,000. Improvements not provided for, but which will be recommended by Commissioner of Streets are: Paving of 13th East to the cemetery, 20,000; paving of State St., from 10th South to 11th South, \$10,000; and paving of Eighth West from Second South to Tenth South, \$18,000.

Salt Lake City, Utah.—County Commissioners have called meeting to discuss further details of plans for road improvements in county under proposed bond issue on which people of county will be asked to vote on Feb. 25. It has been practically decided by commission that 58 miles of permanent road work shall be done, that roads shall be provided with concrete base and that some sort of bituminous surfacing shall be used as a topping.

Salt Lake City, Utah.—County Commissioners have taken no action on matter of setting date for proposed bond election on bond issue for \$1,000,000 for road improvements.

Bristol, Va.—Engineer D. Tucker Brown, who has for several weeks been engaged in surveying proposed new through highways out of Bristol, Va., is now busy making up his estimates of cost of building the roads. These estimates will be forwarded to State highway commissioner at Richmond and will be later transmitted by him to Washington County Board of Supervisors.

Gate City, Va.—Scott County road bonds, amounting to \$167,100, voted for several months ago have been sold at par to Weil, Roth & Co., of Cincinnati. Work of constructing roads is planned to begin early in spring. These bonds apply to only three of magisterial districts of county. Remaining four districts will probably hold bond elections this year.

Lynchburg, Va.—It is expected that joint council committee on streets will be called together shortly to take up paving of Main St. and that at February meeting engineering department will be given authority to ask for bids for work. Improvement of street which includes that portion between Fourth St. and 12th, will cost approximately \$100,000. This will include underground work necessary to renew water pipes and sewers, as well as the conduits for the lighting of the street and ducts for placing all electric wires underground.

Norfolk, Va.—Board of Control has opened and referred to W. T. Brooke, city engineer, bids for paving Princess Anne Ave. with Belgian block for distance of 630 ft. east of present paving line. Bids and bidders are: P. W. Ruth & Co., 42 cts. per sq. yd.; U. S. Sands, 39 cts.; L. Lawson, 44 cts.; F. J. McGuire, 52½ cts.

Olney, Va.—Extension of Olney Road is being planned.

Portsmouth, Va.—At meeting of Norfolk County Board of Supervisors appropriations for road improvements in county were made as follows: Johnston Road, \$600; Lake Drummond and Cornland Road, \$406; Mount Pleasant Road, \$1,000; Rodges Road, \$2,000; Lafayette Boulevard, \$600; Government Ave. and Lynchburg Ave., \$500; Old Cottage Toll Road, from school house to Chapel St., \$250; Ruskin Road, \$800; Mile Bridge Road, \$500; Old Deep Creek Road, \$500.

Chehalis, Wash.—Chehalis City Commission is laying plans to do extensive street paving next season. City Attorney Reynolds has been instructed to prepare resolutions for paving National Ave., from milk condenser plant, where present paving ends, to city limits. Resolution was passed giving notice of hearing on paving of Prindle St., from Northern Pacific railroad tracks to St. Helens Ave., St. Helens Ave. to Pennsylvania Ave., Pennsylvania Ave. from St. Helens to Folsom St., and West St., from State St. to the West Side school. Work is to be done by city's paving plant.

Superior, Wis.—Bids will be asked shortly on five materials for paving of Tower Ave., between 16th and 28th Sts.

CONTRACTS AWARDED.

Coronado Beach, Cal.—To H. C. Fenton, of San Diego, at \$14,000, for paving along strand.

Escondido, Cal.—To Isbell Construction Co., of San Diego, contract by City Trustees for grading and surfacing about two miles of streets for \$8,985.37. C. M. Martin and J. A. Brown were other bidders. Specifications call for 17,715 cu. yds. of excavation and 15,251 cu. yds. of fill.

Pasadena, Cal.—By city, for improvement of St. John's Ave., to Thomas C. Brettenstein, at following prices: Paving, per square foot, 7.98-100 cts.; curb, per lineal foot, 25 cts.; gutter, per square foot, 14 cts.

San Fernando, Cal.—To W. A. Dontanville, Pasadena, Cal., contract at \$8,798.98, for grading, oiling and macadamiz-

ing Porter ave., from Kallisher to Wolfskill st., at San Fernando. H. C. Caldwell is City Clerk.

Santa Ana, Cal.—For constructing 7.2 miles of Garden Grove Anaheim-Cypress Road, to Hart Chamberlain & Ducey, of Anaheim, work including 10,708 cu. yds. excav., 37,960 ft. shaping roadbed, 28.4 yds. A concrete, 8,476 yds. B concrete in pavement, 197 ft. part circle corrugated iron pipe, 1,378 tons crushed rock screenings, 551 tons sand, 683 bbls. oil, 994 lbs. steel.

Bridgeport, Conn.—Highway Commissioner Charles J. Bennett has awarded contract for construction of 5,000 lin. ft. of graded road in town of Hartland to John de Michael & Bro., of Torrington, for \$10,583.55.

Connecticut.—For paving, by Chas. J. Bennett, State Highway Commr., Hartford, as follows: Granby—About 5,653 ft. trap rock macadam road on the Bloomfield-East Granby road, to Amos D. Bridges Sons, Inc., Hazardville, at \$5,964. Glastonbury—About 4,350 ft. trap rock macadam road on the Hartford-Norwich turnpike, to Amos B. Bridges Sons, Inc., at \$7,770.

Hartford, Conn.—Highway Commissioner Charles J. Bennett has given to John de Michael & Brother, of Torrington contract for construction of 5,020 lin. ft. of highway in Hartland for \$10,583.55.

Dade City, Fla.—By Pasco County Commissioners to Edwards Construction Co., Tampa, at \$118,355, to pave 30 miles of road.

St. Petersburg, Fla.—By Pinellas County Commissioners, to Georgia Engineering Co., Augusta, Ga., to construct brick road on 9th st. north, and to Mutual Construction Co., St. Petersburg, for all concrete and culvert work. Cost to county, about \$18,000, one-third of cost.

Tarpon Springs, Fla.—By Pinellas County Commissioners, to W. W. Holmes & Co., Tampa, at \$13,196, to construct brick road from Tarpon Springs to Lake Butler.

Tarpon Springs, Fla.—Daley Bros., of St. Petersburg, for laying of about two miles of concrete sidewalks in Whitcomb Faycu.

Moline, Ill.—To McCarthy Impt. Co. of Davenport, Ia., contract for paving 10th Ave. from 21st to 23d St., and 11th Ave. from 11th to 12th St.

Normal, Ill.—To Roy L. Williams, at \$18,213, for paving on Linden St. and on Vernon Ave.

Peoria, Ill.—By City Council to McElwee & Bushell, at \$21,403.25, for street paving.

Fowler, Ind.—By Board of Commissioners of Benton County, contracts for constructing roads as follows: Donahue Road, W. W. Evans, Fowler, \$7,795; Noll Road, L. W. Rook, Fowler, \$7,793; Mail-loux Road, G. Stillbower, Fowler, \$6,760; Songergrath Road, A. J. Freeland, Freeland Park, Ind., \$4,120; Farrell Road, W. Mahoney, La Fayette, Ind., \$9,595; Mason Road, P. J. Kennedy, Templeton, Ind., \$7,326; Andrews Road, W. Wevans, \$10,525.

Huntington, Ind.—To Garrett, Gordon & Brineman, of Liberty Center, by County Commissioners, as follows: Huntington Ave. road, \$9,384; Roberts road, \$13,684; Day road, \$12,675; Posing road, \$9,381, and Henderson-Woods road, \$8,481.

Marion, Ind.—By Grant County Board of Commissioners, contracts for the construction of the following roads: R. W. Friar road, Center Twp., vitrified brick paving, O. J. Simmons, Marion, \$10,940; L. G. Rhodes, macadam paving, Tarvia binder, Van Buren Twp., J. W. Slater, Upland, Ind., \$11,920. D. L. Horner is County Surv.

Monticello, Ind.—By Commissioners of White County to G. A. Kellenburger, at \$11,595, for constructing Byrvad Road.

Richmond, Ind.—The \$44,500 Barton road contract was sublet at that figure to Trappier & Son of Richmond by H. E. Boyd of Dayton, who received contract from County Commissioners. Boyd is taking responsibility for road construction. He was awarded \$100,000 contract which required his entire time and as Commissioners ordered work to begin on Barton road as soon as contract was let, he could not retain the job.

New Orleans, La.—Bids of Barber Asphalt Co. for paving of Peters Ave. from St. Charles Ave. to Magazine St., and on Apricot St. from Carrollton Ave. to Joliet St., were lowest and contracts have just been awarded to that company. Price on Peters Ave. paving is \$2.30 per sq. yd., which is saving of 39 1-6 cts. per yd. over Fern St. figures, and that on Apricot St.

is \$2.15, or 54 1-6 less than the same figures. Cause for Peters Ave. paving being higher than that of Apricot St., both bids specifying "pitch lake asphalt," is that Peters Ave. paving is to be, on account of being neutral ground street, on a 2 1/2-in. concrete foundation with a 1 1/2-in. asphalt course, making wearing surface of 3 ins. in all, while Apricot St. paving is simply to be naphtha coat on concrete foundation, which means practically a heavy top painting with naphtha mixture.

Shreveport, La.—By Caddo Parish Police Jury, to Healy Construction Co., Meridian, Miss., at \$15,200, to grade 2 1/2 miles Morris Ferry Road.

St. Louis, Mo.—By Bd. Pub. Improv. for street reconstruction as follows: Reconstructing 10th St., from Cass Ave. to Brooklyn St., to John McMahon, 1909 Madison St., grading and shaping, per cu. yd., 91 cts.; granite curb, per lin. ft., 81 cts.; brick pvt., per sq. yd., \$1.70; total, \$11,755. Virginia Ave., from Chipewaw St. to Winnebago St., to Trinidad Asphalt Mfg. Co., De Menil Bldg., grading and shaping, per cu. yd., 68 cts.; granite curb, per lin. ft., 98 cts.; asphalt pvt., per sq. yd., \$1.98; total, \$9,553. Highland Ave., from Goodfellow Ave. to Hamilton Ave., to Granite Bituminous Paving Co., Railway Exchange Bldg., grading and shaping, per cu. yd., 68 cts.; granite curb, per lin. ft., \$1; bitulithic pvt., per sq. yd., \$1.97; macadam, per cu. yd., \$1; total, \$9,623. Clara Ave., from Berlin Ave. to Kingsbury Pl., to Granite Bituminous Paving Co., Railway Exchange Bldg., grading and shaping, per cu. yd., 68 cts.; granite curb, per lin. ft., \$1; bitulithic pvt., per sq. yd., \$1.97; macadam, per cu. yd., \$1; total, \$8,788. Lucille Ave., from Tracy Ave. to Milika Ave., to Hannick Quarry & Constr. Co., Euclid and Ashland Ave., as follows: Grading and shaping, per cu. yd., 30 cts.; combined curb and gutter, per lin. ft., 62 cts.; concrete alley entrances and crosswalks, per sq. ft., 19 cts.; telford pvt., per 100 sq. ft., \$3.40; macadam and screenings, per 100 cu. ft., \$5; gravel sand, per 100 cu. ft., \$5.50; rolling, per day, \$20; 4,277 sq. yds. oiling 5 cts.; total, \$6,347.

Jersey City, N. J.—By Board of Commissioners, for improvement of West Side ave. in front of Holy Name Cemetery, to Contractor Wm. Van Keuren; cement walks around Reservoir playgrounds, to Alphonse Detero; improvement of Pollack ave. from West Side to Mallory ave., to Graham Van Keuren; improvement of Olean ave., to Graham Van Keuren.

Coitville, O.—To James McCarron, Youngstown, O., at \$21,000, for grading and macadamizing of Oak St. and Villa Marcel road. G. M. Montgomery, Youngstown, is Engineer.

Columbus, O.—By State Highway Dept. for constructing roads as follows: Clark County, 2.02 miles of water bound macadam on National Rd. to Graham & Kinnear, of Columbus, at \$14,798. Fairfield County, 4.28 miles of water bound macadam on the Lancaster-Newark Rd. to John P. Kistler, of Lancaster, at \$22,713. Scioto County, one mile on the Portsmouth-Columbus Rd., with brick, to C. H. Rice, of Belmont, at \$15,882.

Springfield, O.—By State Highway Commissioner, to Graham & Kinnear, New Hartman Bldg., Columbus, at \$14,798, for construction of 2.02 miles of waterbound macadam paving on National Road in Clark County.

Zanesville, O.—By director of public service to A. Emery & Son, Zanesville, for following grading, paving and curbing: Woodlawn Ave., from Coopermile Rd. to Pierce St., \$1,467.50; Woodlawn Ave. to Moxahala Ave., \$4,756.80; Woodlawn Ave., from Madison to Madison St., \$6,082.80.

Carriek, Pa.—By Borough Council, to Thomas Cronin Co., Pittsburgh, at \$51,178.01, for grading, concrete curb, steel edge, and vitrified fire clay brick paving, on 6-in. base, on Nobles and Lane Sts.

Connellsville, Pa.—To Duggan & Miller, of Connellsville, at \$13,250, for paving of Race St., between Green St. and Davidson Ave.

Harrisburg, Pa.—State Highway Commissioner Rigelow has awarded contract for resurfacing of road in New Castle Township, Schuylkill County, to Haupt Bros., of Frackville, at \$3,901.64. Award was made subject to approval of local authorities.

Paris, Tex.—By city, to Moxley & Co., Wichita Falls, at \$23,509, to pave Pine Bluff and S. 18th sts.

Olympia, Wash.—By State Highway Comr., for constructing Pacific Highway,

Lewis County, Toledo South, to J. T. Peterson, 117 Smith Ave., St. Johns, Portland, Ore., as follows: 33,048 cu. yds. common excav., inc. haul of 400 ft., 27 cts.; 2,90 cu. yds. common borrow, 32 1/2 cts.; 93,490 cu. yds. overhaul per each 100 ft., 1 ct.; 2.3 acres clearing, \$25; 3.9 acres grubbing, \$50; 18 stumps over 12 in., \$1.25; 37 stumps over 24 in., \$1.50; 77 stumps over 36 in., \$2.50; 65 cu. yds. concrete 1st Class, \$12; 46.3 cu. yds. concrete, 2d Class, \$11; 510 lbs. steel reinforcing bars in place, 6 cts.; 100 lbs. c. i. and spikes in place, 5 cts.; 88 sq. yds. timber cribbing in place, \$2; 30 lin. ft. 6-in. porous tile drain, 10 cts.; 126 lin. ft. 12-in. plain concrete pipe, 40 cts.; 56 lin. ft. 18-in. reinforced concrete pipe, \$1.70; 52 lin. ft. 24-in., \$2.15; 44 lin. ft. 36-in., \$3.15; total, \$12,688. Totals of other bids: Pitson J. Cleaver, Toledo, \$18,986; Jeffery & Buffon, 317 Failing Bldg., Portland, Ore., \$19,180; Jesse T. Mills, Olympia, \$19,095; Fred Shank Co., Chehalis, \$17,552; Allred & James, Centralia, \$19,712; B. H. Garvey & P. Jarvis, Box 847, Seattle, \$17,062; Sloane Bros., Box 348, Seattle, \$15,834; McHugh Contr. Co., 2330 S. E. St., Tacoma, \$18,131; E. F. Young, 1693 11th St., Chehalis, \$18,936; Henriot & Hendricks, 1721 N. Steele, Tacoma, \$20,722. Contract for work on Pacific Highway, Waterfront Rd., Whatcom & Skagit Counties, has been awarded to Quigg Constr. Co., Wenatchee, as follows: 9,000 cu. yds. common excav., inc. haul of 400 ft., 25 cts.; 42,000 cu. yds. solid rock excav., inc. haul of 400 ft., 90 cts.; 40,000 cu. yds. overhaul per each 100 ft., 1 ct.; 18 acres clearing, \$80; 6 acres grubbing, \$80; 4,500 lin. ft. standard pole guard rail, 10 cts.; 6,000 lbs. c. i. and spikes in place, 8 cts.; 4,050 m. ft. timber and plank, \$20; 220 lin. ft. 12-in. plain concrete pipe, 60 cts.; 100 lin. ft. 18-in. reinforced concrete pipe, 80 cts.; 100 lin. ft. 24-in., \$1.20; total, \$51,732. Totals of other bids: Chas. E. Lind, Bellingham, \$57,522; Peterson, Webel & Hawkins, Bellingham, \$63,923; K. Sauset, Bellingham, \$58,062; Clarence Hoard, Victoria, B. C., \$65,090; Sloane Bros., Box 348, Seattle, \$58,915.

SEWERAGE

Blytheville, Ark.—City will shortly let contract for sanitary sewer system estimated to cost \$60,000. Engineer is R. C. Huston, of Memphis, Tenn.

San Diego, Cal.—Dual proceedings will be Council's plan in asking for bids for installation of Ocean Beach sewer system. Bids on cement and clay pipe will be received and Council will accept lowest figure.

Hartford, Conn.—City is planning to construct extension of Homestead Ave. intercepting sewer, also public sewers across private lands and in Catherine and Zion Sts. H. F. Smith is City Clerk.

Stamford, Conn.—Common Council recommends purchase of site of 12 acres for sewerage disposal plant. Estimated cost, \$17,000.

Washington, D. C.—Hillsdale Citizens are urging Commissioners to recommend to Congress passing of bill for placing of sewer to carry off water in Stickfoot branch.

Tampa, Fla.—Constructing 8 to 36-in. sewers and appurtenances, 45 miles, including pumping station, C. Pa. Works. D. B. McKay, chairman tanks, etc.

Atlanta, Ga.—Appropriation of \$85,000 has been asked for completing Highland Ave. and Butler St. sewers.

Savannah, Ga.—City will sell \$600,000 in bonds Jan. 20 for storm sewerage system and house drainage system.

East Moline, Ill.—City Engineer H. G. Paddock has made estimates for laying of about 5,900 ft. of water and sewer pipe in addition near Watertown; estimated cost between \$14,000 and \$15,000.

Mt. Vernon, Ill.—Bids will be received about February for about 3 miles of sanitary lateral sewers, 8-in. clay pipe. B. C. Wells is City Engr.

Rockland, Ind.—It is understood that legislature now in session at Annapolis will be asked to authorize town of Kensington, this county, to issue bonds to raise funds for construction of sewer and water system. Survey has already been made and J. Dawson Williams, Town Attorney, will prepare necessary bill.

Elizabethtown, Ky.—Installation of sewerage system is urged by Mayor.

Louisville, Ky.—Financial statement compiled by Board of Public Works dealing with expenditure of \$1,387,500 sewer fund derived from sale of city's gas stock 18 months ago, shows that about \$125,000

of fund remains unexpended and uncontracted. First Assistant City Engineer Roy Burks, who has been in charge of construction of sewers out of fund, estimates that \$2,000,000 additional is necessary to sewer parts of Louisville where fund did not reach. In many parts of city steps are being taken to ask General Council to pass ordinance permitting a vote on sewer bond issue of at least \$1,000,000. Out of \$125,000 remaining in gas stock sewer fund, small drains will be built principally by city force under Superintendent of Sewer Construction Kast.

Mt. Ranier, Md.—City has engaged Harry Stevens, of Washington, D. C., to prepare plans for sewer and water system, to cost about \$125,000.

Ft. Benton, Mont.—Plans are said to have been approved for construction of sanitary sewers, to cost \$23,000 and storm sewers to cost \$8,000.

Asbury Park, N. J.—Clerk has been instructed to advertise for bids for putting in of lateral sewer connections.

Newark, N. J.—Nine bidders competed for contract to construct section 12 of Passaic valley trunk sewer, when proposals were opened by Passaic Valley Sewerage Commission. The Oscar Daniels Co., of New York, with a bid of \$277,550, was low, but award was deferred for week by Commission. Highest bidder was William J. McCloud & Co., of Elizabeth, who wanted to do job for \$542,400. Other bidders and their figures were: Culp Co., Inc., of Brooklyn, \$504,700; the Kingsbridge Contracting Co., Inc., of New York, \$441,900; the Keystone State Construction Co., of Philadelphia, \$390,000; Bruno & Pettitt, of Belleville, \$356,500; Patrick McMeel, of Brooklyn, \$319,900; Fusco Construction Co., this city, \$318,500; Whiting-Turner Construction Co., of Baltimore, \$301,790. Section for which bids were submitted is located in Acquackanock Township, and extends from 3d ave. to Passaic city line.

Orange, N. J.—Encouraged by action of Mayor Frank F. Murray of Orange in vetoing ordinance passed by Common Council of that city to join with Montclair and East Orange in erecting joint Imhoff sewage disposal system, Frederick Sadler, chairman of joint sewage disposal committee of Bloomfield, will present resolution at Town Council urging immediate action in joining trunk sewer project. It was said that resolution probably would be passed.

Park River, N. D.—Plans are being prepared for installation of comprehensive sewer system.

Grand Forks, N. D.—Plans have been completed by City Engineer H. G. Lykken for mile of new sewer to be laid in Lindsay's addition next spring.

Cincinnati, O.—Plan has been prepared for improving by sewerage Hamilton Ave. from Bruce Ave. to 1,360 ft. north of Springlawn Ave.; Bruce Ave., from Hamilton Ave. to 225 ft. east right of way between Pullan Ave. and Bruce Ave. Fred Schneller is Clerk.

Mansfield, O.—Ordinances have been passed authorizing construction of a 20-in. storm water sewer on Fifth St., from Diamond St. to Franklin Ave., and a 24-in. storm water sewer on Main St., from Fifth to Sixth St., and construction of 36-in. storm water sewer on Surrey Road, from the Rocky Ford of the Mohican to Newman St.; 27-in. storm water sewer from Newman St. to Wayne St., and an 18-in. storm water sewer on Wayne St. from Spring St. to Grace St.

Youngstown, O.—Resolution has been adopted for construction of sewer in Garriek St.

Lebanon, Pa.—Ordinance will be introduced authorizing sewerage of North Side. The proposed line of sewer is as follows: 4th St. and Quitaphalla Creek on both sides of 4th St. to city limit; along city line to west to 11th St.; south on both sides of 11th St. to Church St.; west on both sides of Church to 12th St. to Cumberland. At 12th and Cumberland Sts. intersection, new sewer will connect with present system.

Charleston, S. C.—Petition has been presented asking for early laying of sewers in Rose Garden property.

San Antonio, Tex.—Petition has been presented from Beacon Hill citizens asking for construction of 5,300 ft. of sanitary sewers in that section.

Sherman, Tex.—City will shortly vote on \$15,000 bonds to extend sewer system.

Chilton, Wis.—Engineer Jerry Donahue, of Sheboygan, Wis., will prepare plans for installation of sewerage system and disposal plant to cost about \$30,000.

Niagara Falls, Ont.—Citizens have voted \$5,000 bond issue for storm sewer.

Whitby, Ont.—Citizens have voted to construct sewer system, to cost about \$115,000.

CONTRACTS AWARDED.

Joliet, Ill.—By Board of Local Improvements, contract to W. B. Curtis for constructing sewer, with side connections and appurtenances, in Jasper st., from Market st. to a point 25 ft. east of Raynor ave., and in Willow ave., from Jasper to a point 120 ft. south of McDonough st.

Joliet, Ill.—To John V. McGovern Co., 1116 Chamber of Commerce Bldg., Chicago, contract, at \$22,222.64, for constructing Second Ward sewer system. C. O'Callahan is City Engr.

Rock Island, Ill.—To P. F. Trenken-schuh, of Rock Island, at 60c. per ft., construction of an 8-in. sewer on 40th St., from 8th to 9th Ave., by Local Improvement Board.

Concordia, Kan.—To McGuire & Stanton, Leavenworth, contract for constructing vitrified pipe sewers. E. E. Harper is Engr., Grand Ave. Temple, Kansas City, Mo.

Baltimore, Md.—By Board of Awards, contracts for construction of sanitary lateral sewers as follows: Sanitary contract No. 34, James Ferry & Son, 2111 Madison ave., \$7,242.50; McCarthy & O'Herron, 14 W. Oliver st., \$138,637.50, for lateral sewers, sanitary contract No. 128; Samuel T. Williams, 223 N. Calvert st., \$9,092, lateral sewers, sanitary contract No. 112.

Montevideo, Minn.—To Kircher Bros., St. Paul, contract, at \$1,676.16, for constructing 2,142 ft. sanitary sewer for Montevideo. A. M. Parks is City Clerk.

St. Paul, Minn.—Lowest bid for constructing Woodlawn Fairmount sewer is said to have been submitted by John Lind, at \$86,000.

Kansas City, Mo.—By Board of Public Works, contract to Williams & Samples, 1332 Grand ave., at \$100,000, for constructing vitrified pipe sewer, at Centropolis. Curtis Hill is City Engr.

Asbury Park, N. J.—By City Council to W. K. Fenn Co., of Asbury Park to construct sewer system at about \$9,893.

Rochester, N. Y.—By Bd. of Contract and Supply for constructing Genesee St. outlet sewer, to Rochester Contr. Co., of Rochester, at \$24,637.

Schenectady, N. Y.—To Keith O. Guthrie for constructing superstructure of sewage pumping station in Ferry St. at \$10,850.

Fernwood, Pa.—To Cantrell Construction Co., Philadelphia, Pa., at \$12,600, for construction of sanitary sewers. A. F. Damon, Jr., is Engineer.

Houston, Tex.—By City, to Hunter & Hunter, for construction of following sewers: \$3,383.80 storm water sewer on Fannin st. from Pease st. to Pierce ave.; \$2,158 sanitary sewer on Montgomery and Leland aves., and short sewers on several other streets to be paved; \$5,785.90 storm sewer on San Jacinto st. from Drew to Anita, Elgin to Stuart and Cleburne to Eagle st.; \$21,216.15 storm sewers on Rusl, Capitol, Texas and other streets. E. E. Sands is City Engineer.

Provo, Utah.—To D. H. Ward, of Provo, at \$2,007, for constructing canyon road sewer in Sewer District No. 14.

Manassas, Va.—By City, to Dabbs & Myers, Charlotte, N. C., at \$24,089, to construct sewer system.

WATER SUPPLY

Grand Ridge, Ill.—Proposition has been carried for installation of new water works system.

Peoria, Ill.—Peoria Water Co. will install water meters, lay new feeder main and 30 miles of city mains, as recommended by Engineer Benazette Williams, 54 W. Randolph St., Chicago, Ill.

Springfield, Ill.—Ordinance has been adopted for purchase of electric generator and engine for water works pumping station. T. E. Rensendorfer is City Clerk.

Springfield, Ill.—Ordinance has been passed for purchase of an electric generator and engine to be installed at city water works pumping station. J. E. Dressendorfer is City Clk.

Waukegan, Ill.—Numerous improvements are being considered for water works department.

Clinton, Ia.—City ownership of water works has been voted on favorably.

Humeston, Ia.—Citizens have voted sum of \$21,000 in bonds for installation of water works system.

Coffeyville, Kan.—Following improvements to water works have been recom-

mended: That 6-in. mains be laid on the following streets: On 1st st. from Roosevelt to Elm; on 6th from Beech to Elm; on Beech from 1st to 4th; on Elm from 1st to 12th; on Union from 1st to 8th; on Spring from 4th to 11th; on Davis and on Linden from 4th to 10th; on Sunflower from 4th to 9th; on 14th from Spruce to Maple, and west of the Missouri Pacific shops from 12th to 14th. It is further recommended that an 8-in. main connecting with the big 16-in. main on Roosevelt be laid on 2d, 3d or 5th st. to Walnut st., so as to increase the flow of water in the main in the down town district. A 10-in. main on either 8th or 10th st. from Roosevelt to Spruce is also recommended.

Leon, Kan.—Albert C. Moore, Joplin, Mo., is making plans, estimates and specifications for municipal water works and electric lighting plant. Election will be held shortly to vote bonds.

New Orleans, La.—Bids on contracts which will amount in total to probably over \$225,000 have been opened by Sewer and Water Board. There were eleven bidders, each of which bid on entire list of items embraced in what is known as contract No. 58D. Lowest bidder, according to unofficial estimates, was the Nordberg Mfg. Co., of Milwaukee, Wis., whose figures were at least \$44,000 below next lowest on all of items included. There was but one New Orleans bidder in lot, it being Payne & Joubert Foundry & Machine Co. List of items bid upon was: No. 1, four 12-ft. pumps, built and erected in place; No. 2, each succeeding 12-ft. pump same, as above; No. 3, one 36-in. pump; No. 4, one set each of pumping and discharge piping for pumping station No. 6; three flood gates for pumping station No. 1; No. 7, for each set of blades for the eleven 12-ft. pumps. Bids were all referred to executive committee and general superintendent for tabulation and a report.

Rockville, Md.—It is understood that legislature now in session at Annapolis will be asked to authorize town of Kensington, this county, to issue bonds to raise funds for construction of a water and sewer system. Survey has already been made, and J. Dawson Williams, Town Attorney, will prepare necessary bill.

St. Paul, Minn.—Surveys and plans are being prepared for improving water supply service in St. Anthony Park District and for pumping equipment and reservoir.

Newark, N. J.—Council has authorized bond issue of \$200,000 for extension of water system, and \$100,000 for purchase of land in water shed.

Buffalo, N. Y.—Commissioner Ward, of Public Works Department, has asked for appropriations for installation of chlorine plant.

Lyons, N. Y.—Bond issue of \$142,000 has been authorized for construction of water works system.

Yonkers, N. Y.—The city engineer's office has begun to make preparation for biggest bit of engineering city has ever undertaken—construction of big dams and ducts for better water supply. Preparation of maps for survey of Grassy Sprain valley, which will shut in big reservoir, is first step.

Gastonia, N. C.—Superintendent Rutter of city light and power plant has laid before City Council plans for construction of reservoir lake at Long Creek, source of city's water supply. Proposed lake will hold from 8,000,000 to 10,000,000 gallons of water and will provide reserve water supply sufficient to meet any emergency that might arise. Something over \$1,000 will be expended in excavating reservoir and providing walls to protect lake against flood waters from creek.

Salem, O.—Heavy expenditures are asked for improving water works system.

Umatilla, Ore.—Bonds will shortly be voted for construction of water works. Plans by L. C. Kelsey, of Portland. Estimated cost, \$20,000.

Franklin, Pa.—City Council has passed ordinance for installation of water meters.

Central Falls, R. I.—Resolution is being considered for appropriation of \$13,000 for installing a 16-in. water main on Dexter st.

Charleston, S. C.—Money for municipal water and light plant has been paid over to Commissioners and is now deposited in local bank. Water site on Dicey's Creek, 3 miles north of Camden, has been purchased, and actual work on plant will commence as soon as certain details have been worked out. New plant will represent expenditure of \$125,000.

Orangeburg, S. C.—City Council has awarded \$60,000 city water and light bonds to Security Trust Co., of Spartan-

burg, W. S. Glenn, president, at premium of about \$500. Bonds are to draw interest at 5 per cent.

Huron, S. D.—Notice is given that on Tuesday, the 20th day of January, special election will be held, at which there will be submitted to vote of electors question of issuing bonds in sum of \$22,000, due in 20 years, with interest at 5 per cent. per annum, for purpose of securing site, constructing, installing and equipping mechanical gravity filter plant and increasing the water supply of said city. D. G. Medbery is Mayor.

Sioux Falls, S. D.—Resolution ordering in all water service connections on Duluth ave. from 3d to 13th sts. has been adopted.

Nashville, Tenn.—Funds have been appropriated out of water department as follows: \$15,000 to purchase new meters; \$4,500 to repair buildings at pumping station; \$14,000 to purchase sulphate of alumina; \$4,000 to rebuild south end of workhouse; \$40,000 to purchase water pipe and pay cost of laying same.

Hallettsville, Tex.—City is contemplating installation of water meters in near future.

Sherman, Tex.—Bond issue of \$20,000 for water works extension is being considered.

Seattle, Wash.—Plans have been made for water mains on 26th Ave., S W, to cost about \$15,000.

Seattle, Wash.—Ordinance has been passed providing for submission to qualified electors of city of Seattle at general election to be held in said city on Tuesday, the 3d day of March A. D. 1914, of question or proposition of incurring indebtedness of \$250,000, and of authorizing issuance and sale of negotiable bonds in amount of \$250,000, for purpose of acquiring, by purchase, or by condemnation and purchase, lands and other property for storage reservoir and site for development of water power and other power derived therefrom at Lake Cushman, Mason County, Washington, and for all necessary right-of-way, and of authorizing said \$250,000 of bonds, or so much thereof as shall be necessary, to take place of like amount of bonds of unsold portion of the \$1,000,000 bond issue for "Cedar River Water Supply System," authorized by Ordinance No. 27499 and by vote of the people at special election held on the 5th day of September, 1911. R. B. Hesketh is President of City Council.

Chilton, Wis.—Engineer Jerry Donahue, of Sheboygan, will prepare plans for installation of water works system to cost about \$35,000.

Kingston, Ont.—Installation of a 4,000-gallon pumping engine and laying of large supply main has been recommended by C. C. Fogler, C. E.

CONTRACTS AWARDED.

Hartford, Conn.—To Standard Cast Iron Pipe & Foundry Co., of Bristol, Pa., contract for about 650 tons of cast iron pipe and 10 tons of specials, at \$14,951.10.

Winchester, Ill.—By City Council to C. M. Hawkes, of Jerseyville, Ill., for construction of water works. Work includes 35 172 ft. 4 to 8-in. c. i. pipe, 80,000-gal. steel tank on 100-ft. tower, pumps, etc. Fullerton Coult Co., Engrs., Chemical Bldg., St. Louis, Mo., Guy Faulk, City Clk., Other bidders: H. H. Hall, East St. Louis, \$27,458; The Moffat Co., Des Moines, Ia., \$27,632; T. H. Woolcox, Oglesby, \$28,377; Monie & Dunbar St. Louis, Mo., \$28,421; Arthur A. Dobson, Lincoln, Neb., \$28,588; Jas. A. Pringle, Carthage, Mo., \$28,990; Katz Constr. Co., Omaha, Neb., \$29,474; Municipal Engr. & Contr. Co., Oklahoma City, Okla. \$29,476; Merrifield Constr. Co., Monmouth, \$29,563; Commercial Constr. Co., Kansas City, Mo., \$29,508; W. N. Hay, Woodstock, \$30,597.

Arma, Kan.—To Commercial Construction Co., Reliance Bldg., Kansas City, Mo., contract, at \$31,835, for water works and electric light plant. A. C. Moore is Engr., Bartlett Bldg., Joplin, Mo.

Lynn, Mass.—Following are bids for completing Breed's Pond Dam and constructing dam at Lantern Rock. Contract was awarded to (A) T. Stuart & Son Co., Newton, Mass., at total bid of \$200,307.50. Other bidders: (b) D. F. Crowley, Bristol, Conn., & J. E. Conley, Norwood, Mass., total, \$192,185; (c) H. E. Sproul Contracting Co., Peckskill, N. Y., \$202,576.25; (d) Coleman Bros., Chelsea, Mass., \$227,270; (e) Russo Parker Const. Co., Hudson, N. Y., \$228,933.75; (f) A. G. Tomasello, Dorchester, Mass., \$234,788.75; (g) Long & Little, Leominster,

ter, Mass., \$249,270; (h) Michael Russo & Son, Boston, Mass., \$255,676.25; (i) D. J. Sheehan Co., Lynn, Mass., \$279,350; (j) Holbrook, Cabot & Rollins Corp., Boston, \$292,775; and (k) J. M. Holler, Albany, N. Y., \$366,900. Itemized bids are as follows: 155,000 cu. yds. earth embankment, (a) 65 cts., (b) 60 cts., (c) 80 cts., (d) 80 cts., (e) 84 cts., (f) 80 cts., (g) 90 cts., (h) 92 cts., (i) \$1, (j) \$1.20, (k) \$1.40; 10,225 sq. yds. slope paving, (a) \$1.65, (b) \$1.60, (c) \$1.75, (d) \$1.50, (e) \$1.90, (f) \$1.75, (g) \$2.50, (h) \$2.65, (i) \$2.50, (j) \$1.25, (k) \$3; 9,875 cu. yds. concrete core wall, (a) \$6.25, (b) \$5.80, (c) \$4.50, (d) \$6.50, (e) \$5.75, (f) \$7, (g) \$6.35, (h) \$7, (i) \$6.50, (j) \$7.35, (k) \$8; 4,450 cu. yds. stripping base, (a) 65 cts., (b) \$1, (c) 65 cts., (d) 65 cts., (e) \$1, (f) 60 cts., (g) 60 cts., (h) 40 cts., (i) \$1, (j) 75 cts., (k) \$1.25; 6,000 cu. yds. trench excavation, (a) \$1.50, (b) \$1.50, (c) 75 cts., (d) \$2, (e) \$1.50, (f) \$1.50, (g) \$1.50, (h) \$1, (i) \$2, (j) \$1.50, (k) \$2.50; 3,025 cu. yds. rock excavation, (a) \$3, (b) \$4, (c) \$3, (d) \$3, (e) \$3, (f) \$4, (g) \$3.25, (h) \$3, (i) \$6, (j) \$3, (k) \$6.50. R. H. Sutherland is Chief Engr.

St. Paul, Minn.—Lynchburg Foundry Co. has been given contract for \$50,000 worth of 30-in. pipe. The American Cast Iron Co. contract for \$35,000 worth of 4 to 20-in. pipe. Lynchburg Co. also got contract for \$5,000 worth of 30-in. large special castings, and American Co. the contract for \$4,000 worth of 4 to 20-in. special castings. Contract for \$6,000 worth of fire hydrants has been awarded to South Park Foundry Machine Co., and Cochran-Sargent Co. contract for \$6,000 worth of brass goods. Western Supply Co. contract for \$7,000 worth of valve and service boxes and contract for \$6,000 worth of pig lead to Northwestern Shop & Lead Works.

Lincoln, Neb.—To Abel & Roberts, of Lincoln contract at \$32,944.64, for constructing a concrete and steel conduit.

Jersey City, N. J.—Board of Commissioners has awarded contract to P. J. Kennelly for the improvement of the High Service pumping station at Summit ave., \$875.

Schenectady, N. Y.—By Bd. of Contract & Supply as follows: To Camden Iron Wks., Philadelphia, for furnishing of 7,400 ft. of 36-in. cast iron pipe at \$22.10 per ton; to the East Jersey Pipe Co., 50 Church St., New York the furnishing of 10,500 ft. of lock bar steel pipe at \$4.25 for 3-in. and \$3.55 per ft. for 5-16-in.; to H. K. Corbin, the laying of 17,900 ft. of 36-in. cast iron and steel pipe. The latter company bid for rock excav., \$1.70; cutting asphalt, \$5, and laying pipe, etc., 50 cts. Builders Iron Co. was awarded contract for Venturi meter at \$1,031.

High Point, N. C.—By city, to J. B. McCrary Co., Atlanta, Ga., to construct 3,000,000-gal. reservoir and sewerage disposal plant.

Youngstown, O.—For installation of eight additional filter units and raising clear well, to Wm. M. Henderson, of Youngstown, at \$40,700.

Devon, Okla.—By city, to E. R. Kirby, Lawton, Okla., at \$14,125, to construct water works system.

Columbia, S. C.—To J. C. Fahey, Orangeburg, S. C., at \$13,317, for laying of water mains and sewer pipe. John McNeal is City Engr.

St. George, S. C.—By city, to Modern Equipment Co., Savannah, to install water works and electric light and power plant; water works to be of hydro-pneumatic type.

Georgetown, Tex.—City Council has let contract to Burkett & Williamson, of San Antonio, to bore artesian well to Trinity sands for water purposes in Georgetown. Town recently voted \$13,500 in bonds for this purpose. Well will be commenced Feb. 15 and boring will continue night and day until completed.

Manassas, Va.—To M. Applegate & Son, of Bradford, Pa., for construction of water works system.

Ranchester, Wyo.—To D. C. Evans, Sheridan, Wyo., for installation of a water works and electric light system, at about \$13,000.

LIGHTING AND POWER

Alameda, Cal.—Public Utilities Committee of City Council is to investigate placing of electroliners along Webster St. roadway as planned by Department of Electricity. It is estimated that work will cost \$2,500.

San Diego, Cal.—Petition has been received asking for installation of ornamental street lamps on University Ave., between 5th St. and Park Blvd.

Bridgeport, Conn.—Lamps Committee of Board of Aldermen will ask for appropriation of \$89,538 and for \$16,000, latter to be used for installation and maintenance of proposed ornamental street lighting system. Plans call for 118 additional arc lamps.

St. Augustine, Fla.—Present city lighting contract is about to expire, and Council is planning to advertise for bids, or follow such course as is necessary to make new contract. From trend of discussion it is apparent that Aldermen are anxious to improve street lights, and measures will be taken to have number of additional lights installed and also to get ornamental lights in center of city especially. Charles L. Lyon, superintendent of St. Augustine Gas & Electric Light Co., has submitted proposition for some experimental lighting without cost to city. Proposition was endorsed by Mayor Corbett and approved by Council, work to be done under supervision of street and lane committee.

St. Augustine, Fla.—Plans is being discussed for installation of "white way" in business center of city.

Augusta, Ga.—Plans are being considered for financing a municipal light plant. According to estimate of City Engineer Nisbet Wingfield, plant proposed by committee will cost approximately \$250,000.

Priest River, Idaho.—Council is discussing question of establishing municipal electric light plant in Priest River.

Bath, Ill.—Managers of municipal electric light plant will shortly purchase a 100-amp. generator. L. F. Roloff is manager.

Granite City, Ill.—Granite City Council will act on contract ordinance presented to lighting committee of Council several weeks ago by representatives of Granite City Gas Co., providing for continuance of gas service of that company to city.

Quincy, Ill.—February 2 has been set as date for opening of bids for furnishing of electric light for city hall, work house, and streets during coming three years, at meeting of light committee of City Council.

Springfield, Ill.—Election will be held January 27 for voting on purchase of electric generator and engine to be installed at city water works pumping station.

Sterling, Ill.—Board of Local Improvements of City Council has passed resolution authorizing installation of new system of Boulevard lights for business district of Sterling. System will cover entire business district, from Ave. B east to 2d Ave., Locust St. from 4th St. south to the "Q" and 1st Ave. from 4th St. south to the bridge. Resolution calls for public hearing to be held in city hall on Saturday evening, Jan. 24. Specification calls for new and modern lights, the nitrogen filled globes. This light has been adopted by official board of Panama Exposition, and it is expected when installed here, will be first system of street lighting of kind in America.

Fort Wayne, Ind.—Board of Public Works as result of tour of lighting plant has practically decided on construction of addition to "L" at building to provide space for installation of additional turbine and generator.

Kendallville, Ind.—City Council has approved of ordinance appropriating \$4,000 for posts, equipment and installation of boulevard lighting system on Mitchell and Rush sts.

Richmond, Ind.—Improvement of street lighting system is being planned. Manager Kleinknecht of light plant has advocated a new luminous arc lighting system for entire city in preference to cluster lights for Main St.

Le Roy, Kan.—Bonds in sum of \$13,000 have been voted for installation of municipal electric light plant.

Bowling Green, Ky.—Plans are under consideration for increasing output of municipal electric light plant for maintaining ornamental street lighting system.

Tallulah, La.—J. M. Johnson, proprietor of the ice plant, has submitted to Town Council proposition to take charge of municipal light and water plant for 20 years. Mr. Johnson agrees to furnish city with street lights and water for fire protection free and to give day and night current during summer months and all-night current during winter months. Town is to pay for all extensions to water mains and for lights other than ones now in use.

Thibodaux, La.—Town has decided in order to increase consumption of electricity from its electric light plant to wire all buildings interior work and

make connections with street wires at absolute cost.

Baltimore, Md.—Robert J. McCuen, superintendent of lamps and lighting, has prepared plans for proposed extension of ornamental system of street lighting in business and residential section, including both arc and tungsten lamps. Arc lamps will be installed in business section, about 400 (6.6 amp. lamps) surmounted on ornamental standards, designed by municipal art commission and known as "Baltimore post."

Holyoke, Mass.—Bids have been opened by Manager John J. Kirkpatrick of Gas and Electric Department for new turbine and generator for electric station. Seven bids were received on different items and after all have been thoroughly discussed and inspected and passed upon by expert mechanical and electrical engineers, which will take several weeks, contracts then will be awarded. Manager Kirkpatrick has stated that later Mayor will be requested to authorize loan of \$100,000, amount to be used for payment of new turbine and generator and additional switchboard at electric light station. Among bids were following: for turbine and condenser, Westinghouse Machine Co., \$46,338; Allis-Chambers Co., \$50,600; for turbine alone, from General Electric Co., \$35,730; for an ejector condenser, Deane Steam Pump Co., \$11,998; for surface condenser, Deane Steam Pump Co., \$13,950; Alberger Pump & Condenser Co., \$11,809; Wheeler Condenser & Engineering Co., \$12,750; C. H. Wheeler Co., \$13,150.

South Hadley Falls, Mass.—Citizens have voted in favor of municipal ownership of electric lighting plant.

Taunton, Mass.—Orders have been passed to second reading instructing city election, under direction of committee on public works, to replace all existing naphtha street lights maintained by city with incandescent lights.

Hillsdale, Mich.—Council is said to be considering installation of cluster lamp system for lighting streets.

St. Joseph, Mich.—Plan is being considered for installation of additional street lamps.

Surveys, estimates and report are being prepared for the development of 10,000 horsepower hydro-electric project in Camden County, Mo.

Elizabeth, N. J.—Improvement to street lighting system is being discussed.

Jersey City, N. J.—Board of Freeholders is discussing installation of ornamental iron poles in connection with street lighting system along county boulevard.

Newark Valley, N. Y.—Proposal to issue \$13,000 in bonds for installation of electric light plant has been carried at recent election. Steps will be taken to begin work at once.

Poughkeepsie, N. Y.—Committee of Board of Aldermen composed of Aldermen D'Arcy, Slater and Dougherty have about decided to make trial of furnishing city buildings and offices with cheaper light. They are now considering plan of enlarging pumping station and installing there dynamos and boilers for the purpose. It is estimated that entire cost of plant, including service of expert to look over ground, will amount to about \$5,000.

Syracuse, N. Y.—Ordinance providing for ornamental lighting district has been signed by Mayor Schoeneck. Number of lamps will be increased to 593, making addition of 378 lamps.

Hendersonville, N. C.—The Hendersonville Light & Power Co. is preparing for expenditure of about \$15,000 in water-power development and equipment on Big Hungry, just below site of present power plant of this company.

Sheldon, N. D.—Street lights for Sheldon is one of 1914 possibilities. Village board at present has matter under advisement.

Ford City, Pa.—Should plans now contemplated by Ford City's Council be carried out borough will have new and up-to-date electric light plant in near future. It has about been decided to purchase turbine driven engine, two units, and of 300 kilowatt capacity. This engine with motors, machinery and other appurtenances, including even the building, will cost borough about \$34,000. It is planned to build new electric light and power plant near municipal water plant.

Hughestown, Pa.—Now that borough council of Hughestown has granted franchise to People's Light Co. it is intention of company to extend its mains all through borough.

South Bethlehem, Pa.—Council of new city of South Bethlehem has decided to inquire into cost of municipal electric light plant.

Lincoln, R. I.—If plans now under consideration by Town Council committee on street lights are carried out it will be but short time before every section of town will have benefit of all-night street lighting service.

Woonsocket, R. I.—Several resolutions authorizing joint committee on street lights to contract for incandescent electric street lights have been passed in concurrence by Board of Aldermen.

Woonsocket, R. I.—City Council committee on street lights, comprising Councilmen Louis A. Almon, Louis J. Archambault and Abraham Colitz and Alderman William Howard, is informally considering advisability of taking steps toward better lighting of this city's principal business district.

Deadwood, S. D.—A franchise to operate gas plant and maintain pipes in city for 50 years has been granted by City Council here to H. H. Hyde, present manager of Belt Gas Co. and R. S. Jameson.

Elk Point, S. D.—City Council has taken final steps to enact electric light ordinance and will call special election, to be held Feb. 17, at which proposition of issuing bonds for installing and operating municipal electric light system will be submitted to voters.

Jackson, Tenn.—Proposal to issue \$25,000 in bonds, the proceeds to be used for enlarging power plant and extensions to lighting system, will be submitted to the voters on Jan. 19.

Challettsville, Tex.—City will soon install large number of light meters. The greater part of town will be on meters.

San Antonio, Tex.—Improvement of street lighting system is being considered.

Sherman, Tex.—Bond issue of \$5,000 for street lights is being considered.

CONTRACT AWARDED.

Chicago, Ill.—By County Board, to W. F. Cummings, 3407 W. Monroe St., for all electrical work, at \$69,975, on new county buildings under construction.

Cumberland, R. I.—By town contract with Blackstone Valley Gas & Electric Light Co. for period of ten years which provides for all-night lighting service and installation of new lamps. Company is planning to install 160-cp. lamps on Board St. as soon as possible.

Seattle, Wash.—For installation of cluster lights on Fifth Ave. subdivision No. 1 to Dicken & Rightmire, at \$12,278.70.

FIRE EQUIPMENT

San Diego, Cal.—Favorable consideration of plan proposed by Councilman Schmidt to have May Otway automatic fire alarm system installed in city has been given at mayor's conference. A representative of company has been told to submit estimate of cost.

San Francisco, Cal.—Board of Works has been notified by City Architects that general working drawings and specifications for new fire alarm station, which is to be constructed in Jefferson square, will be ready by Jan. 26, so that bids may be called for on or before that date. City Engineer is preparing designs for mechanical equipment of station, and it is expected that he will report also by that time.

Bridgeport, Conn.—Efforts are being made by local members of Connecticut Humane Society to secure one, if not two, tractors for Fire Department, they to take place of horses now used to haul hook and ladder trucks.

Seaford, Del.—Town Council has been asked to furnish another truck with 500 ft. of hose. With new hose volunteer firemen will have about 3,000 ft.

Richmond, Ind.—Board has authorized advertising for bids on 500 ft. of hose for fire department.

Cherokee, Kan.—Fire department is considering purchase of new ladders, etc.

Beverly, Mass.—Following recommendations have been made for fire department: Signal boxes as often as needs of city require. A new two-way fire house for Ward Three. A tractor for Ladder One at the Central Fire Station. Fifteen hundred feet of new hose. A storage shed for Hose Four for exercises. Wagons, etc. An auto car for chief of department and engine heaters for Central and West St. stations. These recommendations have been referred to committee on fire department.

Chicopee, Mass.—Fire Chief Pomphret has asked for more motor apparatus and 2,000 feet of hose.

Holyoke, Mass.—Appropriation has been asked for purchase of two pieces of motor apparatus and 3,000 feet of hose. T. J. Lynch is chief.

Middleboro, Mass.—Fire District Com-

mission has authorized purchase of motor hose wagon.

Omaha, Neb.—Appropriation of \$30,000 has been asked for by C. H. Withnell, Fire Comr., for purchase of new equipment. Several thousand feet of new hose is needed. C. A. Salter is chief.

Jersey City, N. J.—Bids may shortly be asked for 12,000 ft. of hose. Frank Hague is Commissioner of Public Safety.

Trenton, N. J.—Ferdinand W. Roebbling was purchaser of \$34,000 bond issue to meet cost of improving local fire department. The bonds are 20-year 4½s. and proceeds will be used to erect new house for Engine Company No. 2, at South Broad and Second Sts., and for purchasing two gasoline tractors to be used for drawing the engines instead of horses. Other apparatus, including combination hose wagon, will also be bought from bond proceeds.

West Collingswood, N. J.—Fire Commissioners of West Collingswood have made arrangements to appropriate their first year's assessment for fire apparatus.

Wildwood, N. J.—Wildwood has just voted to give First Ward Company a chemical truck and up-to-date patrol wagon.

Dunkirk, N. Y.—Chief John F. Meiers has recommended purchase of motor ladder truck and additional hose.

Ithaca, N. Y.—Purchase of motor combination chemical and hose wagon and 3,500 feet of hose has been asked for by Chief J. A. Fisher.

Oneida, N. Y.—Announcement has been made by former Mayor J. M. Goldstein that he would donate \$1,000 toward purchase of new fire engine for city, provided authorities would raise balance of equipment price.

Charlotte, N. C.—Purchase of aerial truck and pumping engine is being considered.

Wilson, N. C.—Wilson City Board of Commissioners has closed contract for auto driver fire truck, which is a triple combination of hose wagon, chemical engine and force pump with pumping capacity of 700 gallons per minute and 110 horsepower. Truck cost \$3,500.

Bellefontaine, O.—Purchase of motor apparatus recommended by Chief Horace Blair.

Salem, O.—Purchase of chemical hose truck is recommended.

Springfield, O.—Both Central engine house and one located in N. Factory st. are to be closed properties sold and site selected near west end of city building for central house, if present plans of city commission are carried out.

Toledo, O.—A new motor patrol wagon and ambulance to cost \$5,000 and eight-passenger touring car to be used by firemen, to comprise flying squadron, also to cost \$5,000, will be purchased as safety department equipment directly, if a \$10,000 passenger touring car to be used by fire-000 appropriation favored by Council.

Doyletown, Pa.—Funds are being raised for purchase of combination chemical truck and engine.

Johnstown, Pa.—Fire Chief Logan M. Keller recommends extension of fire limits, prohibiting of "fire" balloons, purchase of new hose, purchase of automobile combination chemical car, and one or two tractors to be attached to present fire engines, at least one piece of auto apparatus each year until all horses are eliminated. He also recommends engine house in 15th or 16th Ward, equipped with automobile apparatus.

Nashville, Tenn.—Appropriation of \$8,000 is being considered for automobile triple combination hose and chemical car for Eastland; \$1,250 and \$7,000 for sites for fire halls in Eastland, and \$2,000 for purchasing hose for fire department.

Ballinger, Tex.—At meeting of City Council it was decided that auto fire truck would replace old wagon pulled by horses which is being used now. Truck will cost in neighborhood of \$4,000, according to Fire Chief Ed. Glover.

Pecos, Tex.—City Council has voted to install more adequate fire alarm system.

Lynchburg, Va.—Mr. Sheffey has had referred to finance committee and to committee on light, fire and electricity, a resolution authorizing and instructing Board of Fire Commissioners to contract for one motor gasoline propelled engine at cost not exceeding \$7,500; 3,000 ft. of fire hose at cost not exceeding \$3,000; furniture, indicator gong and other necessary equipment for West End fire station not exceeding \$1,125.

Newport News, Va.—Mayor Semmes has recommended motorizing of entire fire department.

CONTRACTS AWARDED.

Council Bluffs, Ia.—For 1,000 ft. of hose as follows: P. C. DeVos Hardware Co., local agents for the Eureka Fire

Hose Co., 350 ft. at \$1.10 per ft.; Manhattan Rubber Mfg. Co., 650 ft. at \$1.10.

Long Branch, N. J.—At an adjourned meeting of Board of Commissioners contract for furnishing 1,500 ft. of 2½-inch cotton lined fire hose, with three months' guarantee on 400-pound pressure, was awarded to Empire Rubber & Tire Co., of Trenton, f. o. b., at 98 cts. a ft.

Oneida, N. Y.—The Aldermanic Committee on fire engine has authorized purchase of engine which has been under consideration from company at Providence, R. I. It is Amoskeag engine with American-La France boiler, rebuilt, and of about 700 gallons capacity. Cost is \$2,700.

Columbus, O.—To Gamewell Fire Alarm Telegraph Co., contract for one 4-plate 1-dial manual transmitter, 16 positive non-interfering 16-round successive fire alarm boxes, and 10 standard 7-call police boxes, at \$3,600.

Suffolk, Va.—For two tractors—one for second-size steam engine and other for combination wagon, and one horse-drawn ladder truck with a 40-ft. extension, to American-La France Fire Engine Co., at its bid of \$10,300.

BRIDGES

Indianapolis, Ind.—Representatives of North Side Civic League will appear before County Council at its special meeting, Jan. 16, to ask that appropriation be made for bridge over Fall Creek at Shriver Ave.

Peru, Ind.—County Auditor Frank Mc Elheny has sold \$48,796 of county bridge bonds to J. F. Wild & Co., of Indianapolis. Money is to be used in erecting steel bridge across Wabash River at Broadway, this city.

Salina, Kan.—Question of erecting cement bridge across Smoky Hill river on Iron ave. is being discussed.

Shreveport, La.—Caddo Parish Police Jury has petition War Department for authority to erect temporary bridge over Twelve-Mile Bayou, which at present is crossed by ferry. Department some months ago authorized movable bridge over bayou, which is navigable, but plans by Caddo Levee Board to have mouth of bayou closed for reclamation purposes caused this arrangement to be delayed indefinitely.

New Bedford, Mass.—Order has been adopted appropriating \$2,500 for repair work on Coggeshall St. bridge.

Salem, Mass.—It is expected that in spring work of widening Bridge St. will be begun. Street will be widened to 70 ft. for distance from Winter St. to Beverly bridge.

Fremont, Neb.—Site is being considered for bridge on Pebble creek.

Syracuse, N. Y.—A new bridge over Onondaga Creek, at Oxford St. and reconstruction of bridge over creek at West Newell St. are being considered by city administration with view of making appropriation in tax budget.

Dayton, O.—Members of Edgemont Improvement Association are circulating petition requesting that bridge be built at extremity of Cincinnati st., to replace old wooden structure at Miller's ford that was washed away last spring.

Dayton, O.—Victor C. Smith, County Surveyor, will prepare plans and specifications for construction of concrete arch bridge over Bear Creek, on Eaton Pike.

Youngstown, O.—City Council has taken up proposition of new East Federal St. bridge and has authorized city engineer to draw up another plan and will meet in committee of the whole to consider all plans proposed.

Portland, Ore.—Contract for construction of interstate bridge across Columbia River, at Vancouver, Wash., has been let by commission composed of officials of Multnomah County, Ore., and Clarke County, Wash. Bridge will unite Oregon and Washington links in Pacific highway.

Johnstown, Pa.—Johnstown will soon place on market \$140,000 of bridge bonds. Three issues authorized by old Councils—providing funds for building of bridge between the Seventh and Eighth Wards; one between Fourth and Fifth Wards, and one between Fourteenth and Sixteenth Wards—have been lithographed.

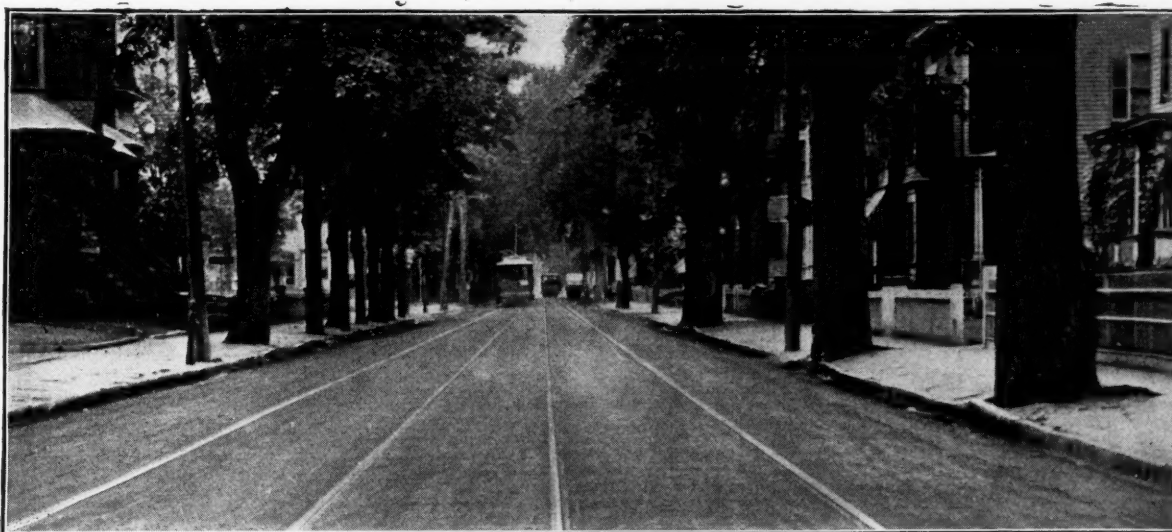
South Bethlehem, Pa.—Erection of bridge across River Lehigh connecting Bethlehem and South Bethlehem, is being planned. Grand Jury of Lehigh County has voted \$95,000 for same.

Chattanooga, Tenn.—Engineering firms over country are expecting competition in selection of plans for new Tennessee River bridge, despite fact that one set of plans has already been furnished by Hamilton County and approved by War Department.

Wood Block Pavement

The Experience of the Connecticut Company

The Connecticut Company operates 75% of the total street railroad mileage in Connecticut, embracing nearly all the principal cities. Mr. R. C. Cram, till recently the Assistant Engineer of this Company, quotes some illuminating experiences with wood block pavement. He states in the Electric Railway Journal of September 6th:



Noble Avenue, north of Barnum Street, Bridgeport, Conn.

"As a paying material, it rivals granite even when wear is considered, and is more readily cut in around obstructions. While trouble is had at times from the tendency of the block to buckle under certain conditions, such troubles are usually quite easy to remedy. The result is a smooth, clean, quiet pavement which is highly desirable, especially in residential sections. It is adaptable to both T and groove rails, and may be quickly replaced after track repairs, even in the winter time, with the least loss of material."

The above illustration shows a typical stretch of wood block pavement laid

in 1907—removed temporarily and replaced in 1910. The photograph was taken in July, 1913, showing the pavement still in first-class condition.

For track use, wood block paving has the advantages of being smooth, clean, noise-deadening, and immune from fracture or damage by rail vibration. It is easily removed and replaced for track repairs without loss of material or extra expense. Its durability exceeds that of granite block.

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Corpus Christi, Tex.—The County Commissioners' Court will issue call for election to be held in all precincts of county for issuance of bonds in sum of \$165,000 for construction of causeway across Nueces Bay and levying of tax to pay interest and sinking fund for such bonds. It is likely that election will be called for third Saturday in February. Causeway will connect mainlands of Nueces and San Patricio Counties, and will follow plans that have been prepared by Engineer Terrell Bartlett of San Antonio, which plans court has already accepted.

Dallas, Tex.—The County Commissioners' Court has passed order for construction of additional steel span for Record Crossing bridge over Elm Fork of Trinity River on Irving Road. Span will cost about \$600 and is to be erected to take place of fill which was washed out by recent rise on Elm Fork. About 60 ft. of approach to bridge was washed away and it will be replaced by new 60-ft. steel span.

Fort Worth, Tex.—Mayor Milam and members of Reservoir Committee will appear before County Commissioners' Court Thursday morning to present new plans for construction of 9-mile bridge at west end of Lake Worth. Proposition has been received from Modern Steel Structural Co. of Waukesha, Wis., for construction of steel bridge at figure lower than those previously submitted.

Clarksburg, W. Va.—Citizens have voted \$110,000 bond issue for construction of concrete bridge to replace present Glen Elk Bridge, and construct steel bridge to connect Glen Elk with main part of city at North 6th St.

CONTRACTS AWARDED.

Marsh Bridge, Del.—To George Delax, contract for erection of bridge between Sussex and Kent Counties.

St. Augustine, Fla.—By City Council, contract to Seth Perkins, of St. Augustine, for construction of reinforced concrete bridge across San Sebastian River and connecting St. Augustine with New Augustine and country to south. Contract price is \$18,950.

Clinton, Ia.—To Thomas Carey & Son contracts for building concrete bridges at intersections of Fountain and Exchange Sts., and Old Main and Ottawa Sts., their bids having been lowest of half a dozen presented on both jobs. Contract prices were respectively \$1,606.68 and \$1,161.48.

Batesville, Miss.—By City, contract for constructing reinforced bridge, to G. A. Draper, of Batesville.

Gulfport, Miss.—Harrison County Supervisors has let contracts for construction of Bayou Delisle, the Wolf River and the Choctaw bridges. C. A. Thompson of Biloxi has secured contract for building of two first named bridges and M. A. Broadus of Saucier will construct third. The Bayou De Lisle bridge, which will be 200 ft. long and will be built of timber on crescoted piles, will cost \$1,200, and Wolf River bridge, which will be 440 ft. in length and will have steel draw, will necessitate expenditure of \$7,500. Mr. Broadus has secured contract for 240-ft. wooden bridge over Choctaw Creek for \$400.

Hattiesburg, Miss.—By Board of Supervisors contract for three steel bridges to be completed by Sept. 6, to Vincennes Bridge Co., of Vincennes, Ind., for \$8,699.

Pass Christian, Miss.—By Supervisors, District No. 3, of Harrison County, to C. A. Thompson, Biloxi, at \$7,500, to construct Adam bridge over Wolf River; length, about 500 ft., including standard steel draw 165 ft., crescoted pine piling and caps, sills and stringers; also to C. A. Thompson, at \$1,200, to build bridge over Bayou Delisle.

Albany, N. Y.—To Walsh Construction Co., Davenport, Ia., at \$72,185, contract by State Department of Public Works, for Contract 116, Erie Canal, for toll road and county line road bridges.

Portland, Ore.—Formal signing of the \$65,000 contract with Waddell & Harrington, engineers, for erection of Columbia River Interstate bridge has been done by County Commissioners of Multnomah County and County Commissioners of Clarke County. Contract was finally signed in form in which it was agreed upon at Vancouver. It provides for flat fee of \$65,000, counties, however, to pay all royalties for use of patent draw spans. This is estimated at about \$15,000. Fee is to be paid at rate of \$4,200 a month, beginning February 1, and continuing until \$58,000 has been paid. Balance of \$6,200 is to be paid when the bridge is completed.

Kittanning, Pa.—Commissioners of Butler and Armstrong Counties have

let contract for approaches to Bear Creek bridge to J. M. White at \$130.

New Castle, Pa.—Of five bidders on contract for new bridge to replace Holstein bridge over Neshannock north of Neshannock Falls, in Wilmington Township, and of six bidders on contract for bridge over Hettenbaugh Run at new site, in Scott Township, the Canton Bridge Co., of Canton, O., was lowest bidder on Holstein bridge, its bid having been \$7,869, while C. E. Kimbrough, of this city, was lowest bidder on Hettenbaugh Run bridge, his bid having been \$1,830. Bids were opened, but the contracts will not be formally let until notice of approval of plans has been received from State Water Supply Commission. Bids on Holstein bridge were as follows: Canton Bridge Co., Canton, O., \$7,869; extra concrete, \$16 per cu. yd. Farris Bridge Co., Pittsburgh, \$8,326; extra concrete, \$15 per cu. yd. Penn Bridge Co., New Brighton, \$8,470; extra concrete, \$16 per cu. yd. C. E. Kimbrough, New Castle, \$8,756; extra concrete, \$12 per cu. yd. Woods-Golder Construction Co., New Castle, \$10,968; extra concrete, \$16 per cu. yd. Bids on Hettenbaugh Run bridge were as follows: C. E. Kimbrough, New Castle, \$1,830; extra concrete, \$10 per cu. yd. John B. Thorson, New Castle, \$2,100; extra concrete, \$20 per cu. yd. George Axe, New Wilmington, \$2,297; extra concrete, \$10 per cu. yd. Charles Londager, Franklin, \$2,400.80; extra concrete, \$18 per cu. yd. Farris Bridge Co., Pittsburgh, \$2,873; extra concrete, \$18 per cu. yd. R. E. Speer, New Castle, \$3,159.50; extra concrete, \$14 per cu. yd.

Philadelphia, Pa.—For construction of wood and steel bridge at Tloga and "C" Sts., to A. L. Fretz & Son.

Fort Worth, Tex.—Contract for construction of Nine-Mile bridge on West Fork of Trinity has been signed by City Commission. Contract was awarded to El Paso Bridge & Iron Co. for \$15,945.

San Antonio, Tex.—By Bexar County Commissioners, to John O. Kelly, at \$12,747.65, to construct concrete bridge on Palo Alto Rd. across Leon River. Terrell Bartlett is Consulting Engineer.

Rainelle, W. Va.—For constructing reinforced concrete bridge over Meadow River, 1½ miles from Rainelle, to Lutten Bridge Co., of Indianapolis, Ind., for \$6,670.

MISCELLANEOUS

Berkeley, Cal.—Municipal authorities are planning to spend \$1,000,000 on harbor improvements.

Colusa, Cal.—Board of Supervisors are discussing question of bond issue for erection of new Hall of Records and bridges and culverts throughout county.

Oakland, Cal.—Bids for installation of elaborate synchronous clock system for new city hall, including master clock, a double-faced clock for Council Chamber and rotunda, and works for four-dial clock in top of tower, have been opened by City Council. Bids, which were referred to the Department of Public Works, were as follows: Standard Electric Time Co., \$4,029; Thomas Day Co., representing the Imperial Clock Co., \$4,950, alternate bid, \$5,600; Sherman Kimball Co., \$5,000; R. W. Edwards, Inc., \$5,396, alternate bid, \$8,613. It is probable that first bid will be accepted.

Boulder, Colo.—County Board plans to build new jail.

Chicago, Ill.—Circulation of petitions for 125,000 names necessary to place question of subway building on ballot in April election has been begun under direction of Alderman Block, chairman of City Council transportation committee.

Chicago, Ill.—City's annual appropriation bill has been passed by Council Finance Committee. After committee has done all cutting and pruning which it thought could be done, appropriations still exceeded estimated revenues for corporate purposes by approximately \$1,000,000. Committee has voted to appropriate \$100,000 for new municipal lodging house, placing amount in proposed bond issue. It is intention of city to sell property in North Union St. now used as municipal lodging house and apply proceeds of sale, together with \$100,000 from bond issue and \$10,000 appropriated for municipal lodging house for women, to erection of modern lodging house. Appropriations contingent on approval of bond issue are as follows: Police stations, \$2,500,000; fire stations and equipment, \$2,500,000; hospital for contagious diseases, \$1,000,000; public baths and comfort stations, \$120,000; municipal lodging house, \$100,000.

Clinton, Ia.—Site will be purchased for Isolation Hospital.

Topeka, Kan.—Erection of new penitentiary is recommended.

Baltimore, Md.—Final action by Board of Awards on recommendation of City Engineer McCay for award of contract for proposed municipal asphalt plant has been withheld pending investigation of City Engineer's claims of saving and advantages that will result from municipally owned plant. In letter sent directly to Mayor Preston as president of Board of Awards, Mr. McCay recommended that contracts be awarded to F. D. Crummer & Sons Co., next lowest bidder for contract. The Ruggles-Coles Engineering Co., of Bayonne, N. J., is lowest bidder, but, according to City Engineer, bid of the other concern conforms more closely to specifications.

Boston, Mass.—Appropriation of \$20,000 is petitioned for purchase and maintenance of police boat.

Boston, Mass.—Accompanying annual report of Board of Harbor and Land Commissioners is recommendation that state appropriate sum of \$15,000 for the improving of New Bedford harbor. For examination, survey, plans and estimates of cost of improving Wellfleet harbor sum of \$1,000 is appropriated, it is proposed. Similar recommendation is made for appropriation of \$1,500 for Provincetown harbor and of \$500 for Edgartown harbor.

Haverhill, Mass.—The expenditure of \$7,000,000 for development of Merrimack River from sea to Ward Hill, above Haverhill, is recommendation of Merrimack Valley Waterway Board. Board's report has been filed with House of Representatives. Of great cost, estimated by board at \$7,000,000 board calls upon state to appropriate \$1,000,000, this appropriation to be contingent upon appropriation from federal government.

Lawrence, Mass.—It has been voted to appropriate \$2,000 to convert station stable into women's quarters and also that commissioner of public safety secure specifications and plans of cell arrangement so that bids could be called for.

Lynn, Mass.—Alterations are being planned for interior of City Hall.

Taunton, Mass.—Purchase of new steam roller is recommended by Superintendent Thayer.

St. Joseph, Mich.—Erection of a juvenile detention home for Berrien County is being considered.

Duluth, Minn.—Ordinance appropriating \$2,500 from works fund for purchase of motor truck has been given its first reading. Machine will be used by sewer maintenance department.

Princeton, Minn.—At special election held in Blue Hill Jan. 8 to vote on proposition submitted by Wiley to build road through that town provided bonds to amount of \$5,000 were voted, proposition carried by 62 to 12.

St. Paul, Minn.—Officers of American Society for Testing Material have been asked to advise city as to proper specifications under which to advertise for bids for proposed new testing machine to be installed by building inspection department. City Chemist Roehrich has announced that bids probably would be invited this week.

Omaha, Neb.—City Legal Department has been asked to immediately prepare ordinance calling election to vote \$100,000 for construction of two incinerator plants.

Jersey City, N. J.—Board, at suggestion of Commissioner Ferris, has adopted specifications for improvement of Wayne St. stables and for sprinklers, dump carts, harness and other supplies to be used in public works department.

Jersey City, N. J.—Director of Streets and Public Improvements James J. Ferris at meeting of Board of Commissioners has presented plans for improvements which will cost city fully \$2,000,000. Commissioners have decided to set apart several days for conference upon projects. At that time they will consider: Howell St. dock improvement, which has been pending before the Board since Dec. 9, when Director Ferris submitted plans for developing nine acres of property the city owns on Hackensack waterfront for dockage and factory purposes. Cost of this improvement as estimated will be \$130,870.50. Plans for construction of relief sewers and reconstruction of sewers throughout city, the cost of which is estimated at \$1,119,126.20. Director Ferris said that prosecution of this work without delay is necessary to conserve health of people of Jersey City. Plans for immediate construction of pipe line in water tunnel under Hackensack to furnish relief pipe line for Boonton water supply, as capacity of one existing pipe has been reached at present time and city

would be shut off from its own supply and have to purchase water from outside companies if this pipe broke. Cost of this improvement is estimated to be \$200,000. Construction at Reservoir No. 2 on west side of Summit Ave. of municipal ice house in which to store 8,000 tons of ice to be cut from city's local reservoir.

Brooklyn, N. Y.—Bids will shortly be advertised for equipment for Fourth Ave. subway.

Whiteville, N. C.—Commissioners of Columbus County are about to build a court house. Bonds in sum of \$50,000 have been sold out of original \$100,000 issue.

Hamilton, O.—Garbage hauling by auto trucks, and then incineration of city's refuse in plant built for purpose is proposed by Jos. Meyers, new director of public service, as solution of problem here.

Tiffin, O.—City Sealer of Weights and Measures Fingerbuth recommends purchase of complete testing outfits for electric, gas and water meters.

Toledo, O.—Instead of \$50,000 appropriation asked by Park Board committee has agreed to recommend \$45,000.

Toledo, O.—Appropriation of \$10,000 has been made for purchase of motor patrol and ambulance for police department, also motor car for "flying squadron" of fire department.

Astoria, Ore.—Port of Astoria Commission has disposed of its \$400,000 bond issue at 96 cts. on the dollar to Chapman, Mills & Co., of Chicago. The money will be used for construction of public docks which when complete will cost in neighborhood of \$800,000.

Florence, Ore.—Commissioners of Port of Siuslaw have voted to issue additional port bonds to amount of \$100,000, and to ask Congress to appropriate like amount. This, with \$150,000 already on hand, makes total of \$350,000, which is considered sufficient to complete project.

St. Helens, Ore.—Proposition of bonding city for municipal dock has been carried.

Erie, Pa.—New wagon tanks and two tank cars to haul garbage from loading station to garbage disposal works will probably be urged upon Council by Director Pelow.

Chester, S. C.—Erection of modern jail is being considered.

Dallas, Tex.—Two new automobiles are to be purchased by city to be used by police department. Police and Fire Commissioner Blaylock will recommend to Board of Commissioners purchase of two five-passenger Ford cars at cost of \$595 each.

El Paso, Tex.—Canvass of voting shows that taxpayers have voted to issue \$350,000 in bonds for erection of joint city and county building.

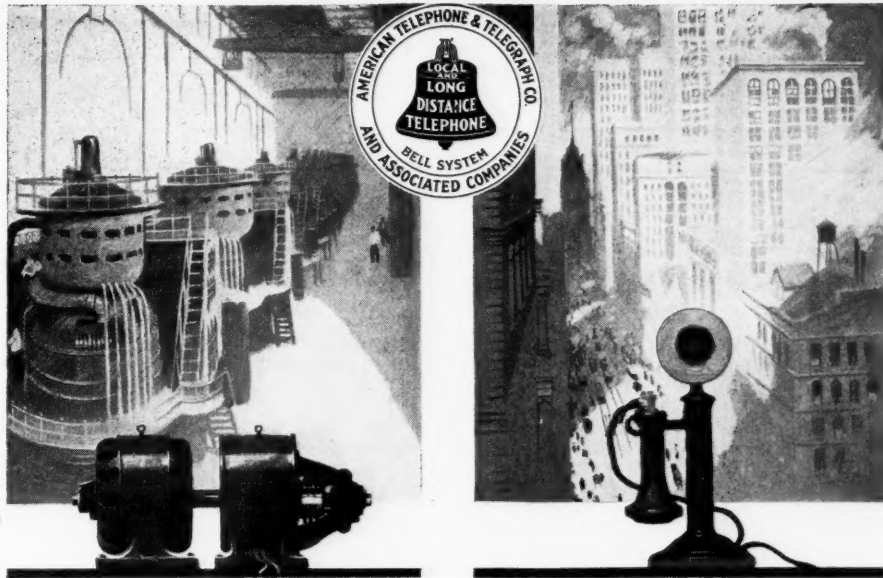
Pecos, Tex.—The City Council of Pecos has voted to buy automobile for use of local fire department.

Sherman, Tex.—City Attorney Joe P. Cox, Jr., has been instructed by City Council to prepare ordinance providing for issuance of public improvement bonds to amount of \$50,000, to be divided as follows: For water works extension, \$20,000; sewerage extension, \$15,000; sidewalk building, \$5,000; street lights, \$5,000; streets, \$5,000. Question will be submitted at early date.

Terrell, Tex.—City Hall bonds for \$40,000 have been carried. Site for same is on North Adelaide St.

Salt Lake City, Utah.—Heber M. Wells, new commissioner of parks, is asking total of \$99,280 as his budget appropriation for present year. During previous year this department spent \$63,732.80 and budget appropriation for year was but \$64,900.83. New commissioner is planning large amount of new work. Principal item is \$12,000 for boulevard work, which has not yet been definitely outlined. It is proposed to spend \$1,800 on playgrounds at Liberty Park, \$2,000 on concerts, \$10,000 on improvements, and \$500 on additional animals for the zoo. At Pioneer Park it is proposed to spend \$500 on park improvements, \$800 on playgrounds and \$600 on concerts. It is also proposed to spend \$2,000 on Canyon Road Park and \$2,000 on new trees to be planted in various parts of the city. New commissioner plans to spend \$2,000 to improve Athletic Park, \$1,500 on the new Sugar House Park and \$5,000 on Douglas Park to place them in condition for use.

Salt Lake City, Utah.—Department will recommend purchase of following new equipment: One steam roller, \$2,500; one traction engine, \$2,300; two graders, \$800; one motor street cleaning machine, \$4,500. There is a question as to whether city should buy motor cleaner or three flushers at cost of



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\$2,700, but it is probable that purchase of cleaner will be recommended.

Lynchburg, Va.—Appropriation of \$35,000 will be asked for street cleaning for year.

Newport News, Va.—Mayor Semmes has recommended erection of suitable City Hall.

Newport News, Va.—Chief of Police T. A. Mitchell has requested Committee on Ordinance and Police through Sergeant Webb, to appropriate \$2,000 for police signal system. He has also requested that motor patrol be purchased.

Norfolk, Va.—In his annual report for 1913, submitted to Board of Control, Dr. J. Plummer Baldwin, city veterinarian, strongly urges establishment of municipal abattoir.

Raymond, Wash.—Preliminary steps have been taken by council for building of city hall at early date. City attorney has been authorized to prepare

ordinance calling for bond election, at which time proposition to bond city for \$20,000 will be submitted to vote of people.

CONTRACTS AWARDED.

St. Petersburg, Fla.—Contract for annex to new city pier has been let at Commissioners' meeting to G. S. Chapman at \$2,142.

Haverhill, Mass.—The Winchester Rock & Brick Co. has been awarded contract to furnish city with crushed stone during 1914, by Municipal Council. Bids were opened as follows: the Massachusetts Broken Stone Co., of Salem, bidding 75 cts., 85 cts., and \$1 a ton, depending upon grade of stone required; the Essex Trap Rock Construction Co., of Peabody, bid 75 cts., 85 cts. and \$1; also, while the Winchester firm bid 70 cts. a ton for all grades.

TOO LATE FOR CLASSIFICATION

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREETS AND ROADS				
Minn.	Bemidji	.....2 p.m., Jan. 30.	Furnishing and installing 52 culverts, 18 to 52 inches.	J. L. George, Co. Aud.
Minn.	Bemidji	.....2 p.m., Feb. 17.	Constructing rural highway, 45.11 miles.	J. L. George, Co. Aud.
Minn.	Crookston	.....10 a.m., Feb. 18.	Grading, turnpiking and clearing portion state road.	H. J. Welte, Aud. of Polk Co.
Minn.	Fergus Falls	.....2 p.m., Mar. 24.	Certain road tools and machinery.	W. Lincoln, Aud. of Otter Tail Co.
SEWERAGE				
Ia.	Storm Lake	.....4 p.m., Feb. 3.	About 4,700 ft. 12, 14 and 16-in. pipe; 5 catchbasins.	W. W. Bennett, Co. Aud.
Minn.	Kelliher	.....9 p.m., Feb. 9.	Laying sewer main, disposal plant, etc.	City Clerk.
WATER SUPPLY				
Cal.	Pasadena	.....10 a.m., Jan. 27.	Quantity of cast-iron water pipe.	City Clerk.
Neb.	David City	.....9 a.m., Jan. 29.	Constructing addition to water works.	City Clerk.
LIGHTING AND POWER				
N. D.	Minnewaukon	.....2 p.m., Feb. 3.	Installing electric light plant in court house.	W. E. Paulson, Co. Aud.
N. J.	Elizabeth	.....Feb. 5.	Lighting streets with electricity, optional period.	Com. on Street Lighting.
MISCELLANEOUS				
Mo.	Richmond	.....Feb. 2.	Constructing \$100,000 court house	J. J. Pardue, Co. Treas.
Minn.	Anoka	.....4 p.m., Feb. 9.	Constructing armory building	Bd. Armory Supv., St. Paul.
Mont.	Helena	.....8 p.m., Mar. 2.	Two 600-gallon tank street sprinklers	E. J. McConnell, City Clk.

STREETS AND ROADS

Gadsden, Ala.—Agitation in favor of street paving will be started early in the spring.

New Haven, Conn.—City will issue bonds to amount of \$530,000 immediately, of which \$480,000 is for permanent pavements and \$50,000 for sewer improvements. Entire issue has been taken by firms of Estabrook & Co., of Hartford, Conn., and R. L. Day & Co., of Boston, Mass., joint bidders. Total bid was \$535,735.

Washington, D. C.—Senator Sheppard has reintroduced in Senate his resolution authorizing survey and examination of Rio Grande border of United States to determine advisability of constructing highway along border.

Atlanta, Ga.—Construction of boulevard from this city to Stone Mountain is being discussed.

Springfield, Ill.—Brick paving of Adams St., between 7th and 10th St., is being discussed.

Indianapolis, Ind.—Engineering department of Board of Park Commissioners is preparing plans for number of improvements that are to be undertaken this year. One of most important improvements contemplated is building boulevard along north bank of Pleasant run, from Washington St. to Emerson Ave., and along south bank of stream from Emerson Ave. to New York St. As part of this plan it is proposed to vacate New York St. from Emerson Ave. to Pleasant run. Another extensive improvement will be paving Maple Road, formerly 38th St., from Capitol Ave. to Fall Creek. This will be asphaltic concrete pavement laid on concrete foundation. Roadway will be 40 ft. wide, but including sidewalks and lawn spaces width of thoroughfare will be 100 ft. Plans also are being prepared for paving the Capital Ave. Blvd., from Indiana Ave. to North St. An asphaltic concrete pavement on concrete foundation is being considered.

Clinton, Ia.—Resolutions have been adopted for paving of Ninth and Tenth Aves.

Lexington, Ky.—Announcement has been made that County Judge F. A. Bullock proposes to meet requirements of good roads in Fayette County by bond issue of \$500,000 or more, with which to reconstruct main roads of county and to build every mile of turnpike with asphalt binder. It is expected that plan

will be worked out this summer and submitted to people for their approval at next election this fall.

Annapolis, Md.—Appropriation of \$6,000,000 for completion of main arterial system of state roads, is asked in report of State Roads Commission filed with Legislature by Chairman C. E. Weller.

Baltimore, Md.—State Road Commission proposes to change route of Baltimore-Annapolis boulevard to pass through Brooklyn to Light St. bridge.

St. Paul, Minn.—Paving Cherokee and Smith Aves., on west side, from terminus of high bridge to Annapolis St., making continuous highway with Dodd Road, extending from Dakota County to St. Paul, is being urged by members of Grand View Heights Improvement Association.

Gulfport, Miss.—A 40-ft. shell or macadam beach boulevard from Gulfport and Biloxi, and possibly from Gulfport to Pass Christian, is proposed. Plan is to work the county convicts on highway.

St. Joseph, Mo.—Ordinances have been passed authorizing improvement of various streets.

Atlantic City, N. J.—Contract for widening of Boardwalk from Maryland Ave. to Rhode Island Ave., to 60 ft., and from that point to New Hampshire Ave. to 40 ft. will have been awarded before March 1st, according to City Engineer John Hackney.

Lestershire, N. Y.—A brick pavement, to be built under auspices of State Highway Department, will be constructed during coming year on Main St. to Riverside Drive. Estimated cost of construction, according to State Highway Department, will be \$31,400. State will pay 65 per cent., or \$6,955; Broome County will pay \$3,745, and extra cost to the village of Lestershire will be \$20,700.

Mansfield, O.—Resolutions have been adopted for improvement of various streets.

Eugene, Ore.—Issues of 6 per cent. street improvement bonds, one for \$17,400, another for \$17,150, and third for \$8,400, have been sold to Portland firm, the Lumbermen's National Bank, for \$100.76 and accrued interest.

Erie, Pa.—Opening of 30th St., between Shenk Ave. and the Old French Road, is being discussed.

Johnson City, Tenn.—Election will be held in Washington County on Feb. 25 for purpose of voting on proposition to issue \$415,000 in road bonds.

Manchester, Tenn.—Road Committee

appointed by Chairman Crocker of County Court will meet and lay out system of proposed pikes for county, and submit its report to special term of County Court to be called at early date. If Court decides favorably on report, it will immediately call election to vote on question of road bonds.

Dallas, Tex.—Specifications have been approved and bids invited by Board of Municipal Commissioners for paving of Garrett, Oakland, Munger and Griffin. These contracts will cover all of street paving to be done by city in present fiscal year, it was announced by Street Commissioner Scott. Call for bids invites estimates on creosoted wood blocks, bitulithic, westrumite, vibrolithic, Bermudez asphaltic concrete and Uvalde rock asphalt. Garrett is to be paved from Ross to Live Oak; Oakland from Grand to city limits on south; the west side of Munger, east already paved at private expense, between Junius and Reiger, and Griffin between Elm and Pacific.

Itasca, Tex.—County Commissioners' Court of Hill County has ordered an election in Itasca road district, which comprises Itasca and surrounding territory, to be held Feb. 21 for purpose of voting on road bonds amounting to \$150,000.

McKinney, Tex.—Petitions from Celina good roads district and Farmersville good roads district have been filed with Commissioners' Court and election has been granted in each case, Feb. 21 being named as day on which elections will be held. Farmersville district asks for issue of \$200,000, while Celina asks for \$125,000. Petition from Colleoka, which had been filed with court, was withdrawn in order to make some minor corrections, but will be presented again before the court adjourns. This district is asking for \$65,000. Petition is also before court for bond issue in Prospect good roads district, asking for issue of \$100,000. Plano and Wylie are both busy with petitions, but they will hardly be filed at this term of Commissioners' Court.

Waco, Tex.—County Commissioners have selected Feb. 14 as date on which the property taxpaying voters of Justices Precincts 1 and 3 of McLennan County will determine whether they favor issuance of bonds to extent of \$1,075,000 for good roads. Should proposition carry it will connect with good roads from Waco almost to Dallas on north, with exception of few miles in Hill County; to Coryell County on west and to Eddy, 20 miles from here, on south.



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CONTRACTS AWARDED.

Oxnard, Cal.—To Conrad Sherer, Stimson Bldg., Los Angeles, at 6 cts. per sq. ft. for regrading and resurfacing Flinta St. Work consists of 159,000 sq. yds. of macadam, and to Andrew Hollway contract at \$23,293.20 for improving North Lake Ave., between Colorado and Orange Grove Aves. Work consists of 131,600 sq. ft. of macadam paving.

PROPOSALS

SEWERS

Sealed proposals will be received at the rooms of the Borough Council, Bogota, New Jersey, at eight o'clock p. m. on the 9th day of February, 1914, as follows:

1st.—For furnishing all material and doing all work necessary to the complete construction of about 4.4 miles of vitrified sewers, from eight (8) to twenty-four (24) inches in size, with Y branches, manholes, flush tanks and other necessary appurtenances.

2nd.—For furnishing all material and doing all work necessary to the complete construction of two disposal plants, including the necessary piping, grading, etc.

Plans may be seen and specifications and forms of proposal obtained at the office of the Borough Clerk, Bogota,

N. J., or at the office of Clyde Potts, 30 Church Street, New York City.

Each bid must be accompanied by a certified check on a solvent bank as follows:

For the first proposition, as above \$3,000.

For the second proposition, as above \$2,000.

The Borough reserves the right to reject any or all bids, to waive any informality in the bids received, and to accept any bid which it deems to be most favorable to the interests of the Borough.

Contractors may bid on any one proposition or on both.

WILLIAM N. SMITH, Mayor.

HARLAN P. ROSS, Borough Clerk.

January 13, 1914.

THE CITY OF READING, PA.
DEPARTMENT OF PUBLIC SAFETY.

Reading, Pa., January 2nd, 1914.

Sealed proposals will be received at the office of the City Clerk, until 10 A. M., Wednesday, February 4th, 1914, for the collection and destruction of all garbage and offal in the City of Reading, for the periods of one year, three years and five years.

A certified check or proposal bond, executed by a trust company authorized

to do business in the State of Pennsylvania as surety; and authorized by the Courts of Berks County to become surety in judicial proceedings therein, in the sum of two thousand dollars (\$2,000.00) must accompany each bid; and the successful bidder will be required to enter into a contract bond, with a like trust company as surety, in the sum of ten thousand dollars (\$10,000.00).

Blank forms of proposals, proposal bonds and specifications may be obtained at the office of the Superintendent of Department of Public Safety, City Hall.

Proposals must be endorsed "Proposals for Garbage" and addressed to the Department of Public Safety, in care of the City Clerk, of Reading, Pa.

The right is reserved to reject any or all bids.

By order of the Department of Public Safety.

PETER S. HOLL, Superintendent.

WANTED—A general superintendent for large asphalt business in vicinity of New York. Salary \$3000.00 to \$3500.00, according to man. Will be expected to give majority of time to active outside supervision. Must be man of experience. Address, Box 37a Municipal Journal, 50 Union Square, New York.

NOTICE TO CONTRACTORS

NOTICE TO CONTRACTORS—State of New York—Office of the State Commission of Highways, Albany, N. Y.—Pursuant to the provisions of chapter 30, Laws of 1909, as amended by chapter 646, Laws of 1911, and chapter 80, Laws of 1913, sealed proposals will be received by the undersigned at their office, No. 55 Lancaster street, Albany, N. Y., at 1 o'clock P. M. on Friday, the 30th day of January, 1914, for the improvement of the following highways:

County.	Road No.	Name	Approx. Length	County.	Road No.	Name	Approx. Length
Allegany	5419	Andover Village	1.51	Niagara	5416	Cambria-Wrights Corners	7.80
Broome	5390	Binghamton City-State Hospital	0.33	Niagara	5417	Pekin-Cambria	5.40
Broome	5412	Union Village: Main and Bridge Streets	0.28	Oneida	5345	Trenton-Prospect-Remsen	5.86
Broome	5413	Binghamton City: Front Street	0.82	Onondaga	1068	Niles-Mandana	3.12
Cattaraugus	5418	Carrollton-Kill Buck	4.41	Orleans	5421	Holley-Brockport, Part 1	2.40
Chenango	5414	Norwich-Oxford	9.64	Orleans	5422	Albion-Fancher	3.43
Cortland	5424	Virgil-Cortland	5.96	Orleans	5423	Hartland-Medina, Part 2	6.02
Monroe	5425	Holley-Brockport, Part 2	3.26	Oswego	5415	Central Square-Union Square, Part 2	5.81
Also for the repair of the following highways:				Otsego	1147	Schenevus Village: Elk Street	0.20
Repair Contract Number	Class of Work	Road No.	Name	Tioga	5420	Owego-Candor, Part 1	1.63

Contract Number	Class of Work	Road No.	Name	County	Town
482	Brick	176	Albany-Schenectady, Part 1	Albany County	Colonie
486	W. B.	853	Batavia-Elba	Genesee County	Batavia Elba
485	Asphalt	5	East Avenue	Monroe County	Brighton
489	Brick	63	Scottsville, Section 1	Ontario County	Chili
487	Brick	333	Geneva-Canandaigua, Section 3	Orleans County	Geneva
488	W. B.	386	Five Corners-Kuckville, Section 1	Rockland County	Gaines
483	Asphalt	91	Nyack Turnpike	Saratoga County	Ramapo
481	Brick	243	Mechanicville-Stillwater	Westchester County	Stillwater
484	Asphalt	18	Ardsley-Elmsford, Section 1		Greenburgh

Maps, plans, specifications and estimates may be seen and proposal forms obtained at the office of the Commission in Albany, N. Y., and also at the office of Division Engineer Bertrand H. Wait, Realty Building, White Plains, N. Y., for contracts in the counties of Rockland and Westchester, also at the office of Division Engineer Harvey O. Schermerhorn, Humane Building, Albany, N. Y., for contracts in the counties of Albany and Saratoga, also at the office of Division Engineer James H. Sturdevant, Chamber of Commerce Building, Utica, N. Y., for contracts in the county of Oneida, also at the office of Division Engineer Howard E. Smith, 901 Press Building, Binghamton, N. Y., for highways in the counties of Broome, Chenango and Otsego, also at the office of Division Engineer Charles J. McDonough, 433 South Salina street, Syracuse, N. Y., for highways in the counties of Cortland, Onondaga and Oswego, also at the office of Division Engineer Perry Filkin, 423 Cutler Building, Rochester, N. Y., for highways and contracts in the counties of Genesee, Monroe, Ontario and Orleans, also at the office of Division Engineer Frederick S. Strong, St. Ann Federation Building, Hornell, N. Y., for highways in the counties of Allegany and Tioga, also at the office of Division Engineer William M. Acheson, Lockwood Building, Buffalo, N. Y., for highways in the counties of Cattaraugus and Niagara.

The especial attention of bidders is called to "Information for Bidders" in the itemized proposal, specifications and contract agreement.

Proposals for each contract must be presented in a separate sealed envelope endorsed on the outside with the number of the highway or repair contract for which the proposal is made. Each proposal must be accompanied by a draft or certified check issued by a national or state bank in good credit within the state and payable at sight to the order of the State Commission of Highways for an amount equal to at least five per cent. of the amount of the proposal which such draft or check accompanies.

This draft or check will be held by the Commission until the contract and bond are duly executed.

The successful bidder will be required to give a bond for fifty per cent. of the amount of the contract, such bond to be executed by a Surety Company to be approved by the Commission, or a bond secured by the deposit of collateral securities to be approved by the Commission.

The right is reserved to reject any or all bids.

R. K. FULLER, Secretary.

JOHN N. CARLISLE, Commissioner.